IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants : David M. Berezowski et al

Application No. : 09/823,705 Confirmation No.: 7437

Filed : March 30, 2001

For : SYSTEMS AND METHODS FOR IMPROVED AUDIENCE MEASURING

Art Unit : 2424

Examiner : Annan Q. Shang

New York, New York 10036
May 18, 2009

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AMENDED APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Madam:

In response to the April 17, 2009 Notification of Non-Compliant Appeal Brief, appellants are submitting this Amended Appeal Brief pursuant to 37 C.F.R. § 41.37(d). Pursuant to MPEP § 1205.03, this Amended Appeal Brief is a complete new brief with the required corrections.

Appellants believe that no fee is required in connection with this Amended Appeal Brief. However, the Director is hereby authorized to charge any fees that may be due, or credit any overpayment of the same, to Deposit Account No. 06-1075 (Order No. 03597-0193).

This Amended Appeal Brief is submitted in support of the appeal from the final rejection of claims 1-6, 8-11,

13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 in the Final Office Action dated March 22, 2007. A Notice of Appeal for this case was filed on September 20, 2007 along with a Pre-Appeal Brief Request for Review. Appellants then received a Notice of Panel Decision from Pre-Appeal Brief Review dated February 8, 2008 stating that appellant is required to submit an appeal brief in accordance with 37 C.F.R. § 41.37.

In view of the arguments and authorities set forth below, the Board should find the rejection of claims 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 to be in error, and the Board should reverse the rejection.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

(i.) Real Party In Interest

(ii.) Related Appeals and Interferences

(iii.) Status of Claims

(iv.) Status of Amendments

(v.) Summary of Claimed Subject Matter

(vi.) Grounds of Rejection to be Reviewed on Appeal

(vii.) Argument

(viii.) Claims Appendix

(ix.) Evidence Appendix

(x.) Related Proceedings Appendix

(i.) Real Party in Interest

Appellants respectfully advise the Board that the real party in interest in the above-identified patent application is United Video Properties, Inc., a corporation organized and existing under the laws of the State of Delaware, and having an office and place of business at 6922 Hollywood Boulevard, Los Angeles, CA 90028, which is the assignee of the entire interest in this application.

(ii.) Related Appeals and Interferences

Appellants advise the Board that there are no other appeals or interferences known to appellants, appellants' legal representative or appellants' assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(iii.) Status of Claims

Claims 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 are rejected in this application and are on appeal. Claims 7, 12, 47-49, 57, 59, 86, 91, 126-128, 136, 138, 165, 170, 205-207, 215, and 217 have been cancelled.

(iv.) Status of Amendments

Appellants have not submitted any amendment pursuant to 37 C.F.R. § 1.116 or in reply to the March 22, 2007 Final Office Action (hereinafter "Final Office Action"), from which this appeal is being sought.

(v.) Summary of Claimed Subject Matter

Appellants' independent claims 1, 80, and 159 are directed to a method and systems for measuring audience size information based on playbacks of a recorded program. Indications of playbacks of the recorded program are received from a plurality of audience members. In response to receiving these indications, audience size information is updated and this updated information is then provided to at least one user within an interactive television application.

Support in the specification for claims 1, 80, and 159 is found at least in the locations indicated in the following table:

Claim 1	The Specification
A method for measuring audience size information based on playbacks of a recorded program comprising:	FIG. 18, p. 8, ll. 18-21
Receiving indications of playbacks of the recorded program from a plurality of audience members;	FIG. 18, p. 38, ll. 4-25
Updating audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and	FIG. 18, p. 39, ll. 15-17
Providing the updated audience size information to at least one user within an interactive television program.	FIGs. 5-16, p. 39, ll. 15-23

Claim 80	The Specification
A system for measuring audience size information based on playbacks of a recorded program comprising:	FIGs. 3, 4, p. 8, ll. 18-21
means for receiving indications of playbacks of the recorded program from a plurality of audience members;*	p. 16, l. 30 – p. 17, l. 38, p. 38, ll. 4-25
means for updating audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and*	p. 17, ll. 16-25, p. 39, ll. 15-17, p. 10, ll. 2-8
means for providing the updated audience size information to at least one user within an interactive television application.*	p. 18, ll. 21-33
Claim 159	**The Specification**
A system for measuring audience size information based on playbacks of a recorded program comprising:	p.8, ll. 18-21
a user input device;	FIG. 4, p. 23, ll. 27-32
a display device;	FIG. 4, p.23, l. 28 – p. 24, l. 10.
an interactive television application implemented at least partially on control circuitry and programmed to:	p. 16, l. 30 – p. 17, l. 38, p. 38, ll. 4-25

* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

receive indications of playbacks of the recorded program from a plurality of audience members;	FIGs. 2, 3, p. 19, ll. 19-28
update audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and	p. 17, ll. 16-25, p. 39, ll. 15-17, p. 10, ll. 2-8
direct the display device to provide the updated audience size information to at least one user within an interactive television application.	p. 18, ll. 21-33

Appellants' independent claims 29, 108, and 187 are directed toward a method and systems for providing audience size information with program listings in an interactive television application. Indications that a user wishes to access one or more program listings are received from a user. Audience size information for a program corresponding to at least one of the program listings is calculated. The calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members.

Support in the specification for claims 29, 108, and 187 is found at least in the locations indicated in the following table:

Claim 29	The Specification
A method for providing audience size information with program listings in an interactive television application comprising:	FIG. 7, p. 25, ll. 7-11, p. 28, ll. 21-31

receiving an indication from a user that the user wishes to access one or more program listings;	p. 30, ll. 6-20
calculating audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members; and	FIG. 19, p. 40, l. 24 – p. 41, l. 19
providing the one or more program listings in response to the indication, wherein at least one of the one or more program listings includes audience size information for a program corresponding to a program listing.	FIG. 20, p. 41, l. 31 – p. 42, l. 25
Claim 108	**The Specification**
A system for providing audience size information with program listings in an interactive television application comprising:	p. 25, l. 7-11, FIG. 7, p. 28, ll. 21-31
means for receiving an indication from a user that the user wishes to access one or more program listings;*	FIG. 2, p. 35, ll. 26-34

* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

means for calculating audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members; and*	FIG. 19, p. 40, l. 24 – p. 41, l. 19
means for providing the one or more program listings in response to the indication, wherein at least one of the one or more program listings includes audience size information for a program corresponding to a program listing.*	FIG. 20, p.41, l. 18-23
Claim 187	**The Specification**
A system for providing audience size information with program listings in an interactive television application comprising:	p.8, ll. 18-21
a user input device;	FIG. 4, p. 23, ll. 27-32
a display device; and	FIG. 4, p.23, l. 28 – p. 24, l. 10.
an interactive television application implemented at least partially on control circuitry and programmed to:	p. 16, l. 30 – p. 17, l. 38, p. 38, ll. 4-25
receive an indication from the user input device that a user wishes to access one or more program listings;	FIG. 2, p. 35, ll. 26-34

* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

calculate audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members; and	FIG. 19, p. 40, l. 24 – p. 41, l. 19
direct the display device to provide the one or more program listings in response to the indication, wherein at least one of the one or more program listings includes audience size information for a program corresponding to a program listing.	FIG. 20, p.41, l. 18-23

Appellants' independent claims 51, 130, and 209 are directed toward a method and systems for measuring audience size information for an upcoming program in an interactive application. Indications to perform actions related to the upcoming program are received from a plurality of audience members. Audience size information is updated in response to receiving the indications. Audience size information is then provided to at least one user within the interactive television application.

Support in the specification for claims 51, 130, and 209 is found at least in the locations indicated in the following table:

Claim 51	The Specification
A method for measuring audience size information for an upcoming program in an interactive application comprising:	FIG. 20, p. 41, ll. 3
receiving indications from a plurality of audience members to perform actions related to the upcoming program;	FIG. 20, p. 41, l. 31 – p. 42, l. 8
updating audience size information for the upcoming program in response to receiving the indications; and	FIG. 20, p. 42, ll. 9-17
providing the audience size information to at least one user within the interactive television application.	FIG. 20, p. 42, ll. 17-25
Claim 130	**The Specification**
A system for measuring audience size information for an upcoming program in an interactive application comprising:	FIG. 20, p. 8, ll. 18-21
means for receiving indications from a plurality of audience members to perform actions related to the upcoming program;*	FIG. 20, p. 16, l. 30 – p. 17, l. 1,
means for updating audience size information for the upcoming program in response to receiving the indications; and*	FIG. 20, p. 17, ll. 16-25

* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

means for providing the audience size information to at least one user within the interactive television application.*	p. 10, ll. 2-8
Claim 209	**The Specification**
A system for measuring audience size information for an upcoming program in an interactive television application comprising:	FIG. 20, p. 8, ll. 18-21, p. 42, ll. 17-25
a user input device;	FIG. 4, p. 23, ll. 27-32
a display device; and	FIG. 4, p.23, l. 28 – p. 24, l. 10.
an interactive television application implemented at least partially on control circuitry and programmed to:	p. 16, l. 30 – p. 17, l. 38, p. 38, ll. 4-25
receive indications from a plurality of audience members to perform actions related to the upcoming program;	FIG. 20, p. 16, l. 30 – p. 17, l. 1,
update audience size information for the upcoming program in response to receiving the indications; and	FIG. 20, p. 17, ll. 16-25
direct to display device to provide the audience size information to at least one user within the interactive television application.	p. 10, ll. 2-8, p. 42, ll. 17-25

Appellants' dependent claims 9, 88*, and 167 are directed towards methods and systems for updating audience size information based on the number of times a plurality of audience members played back a recorded program.

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* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

Support in the specification for claims 9, 88, and 167 may be found, for example, on page 30, lines 22-27, page 38 line 33 through page 39, line 2, and page 39 lines 12-14.

Appellants' dependent claims 71, 150*, and 229 are directed towards a method and systems for updating audience size information based on the number of times a plurality of audience members performed actions related to an upcoming program. Support in the specification for claims 71, 150, and 229 may be found, for example, on page 42, lines 9-25.

Appellants' dependent claims 10, 89*, and 168 are directed towards a method and systems for, inter alia, updating audience size information based on a user-identified action that controls how a recorded program is played back. Support in the specification for claims 10, 89 and 168 may be found, for example, on page 36, line 34 through page 37, line 15.

Appellants' dependent claims 8, 87*, 166 are directed towards a method and systems for, inter alia, updating a market share of a recorded program. Support in the specification for claims 8, 87 and 166 may be found, for example, on page 3, lines 12-17, page 4, lines 14-19, and page 26, line 32 through page 27, line 5.

Appellants' dependent claims 58, 137*, 216 are directed towards a method and systems for, inter alia, updating a market share of an upcoming program. Support in the specification for claims 58, 137 and 216 may be found,

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* Hereby identified as a means-plus-function element pursuant to 37 C.F.R. §41.37(c)(v).

for example, on page 3, lines 12-17, page 4, lines 14-19, and page 26, line 32 through page 27, line 5.

(vi.) Grounds of Rejection to be Reviewed on Appeal

The following ground of rejection is to be reviewed on this appeal:

A. Whether claims 1-6, 11, 13-28, 80-85, 89, 92-107, 159-164, 169, and 171-186 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

B. Whether claims 29-46, 50, 108-125, 129, 187-204, and 208 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

C. Whether claims 51-56, 58, 60-70, 72-79, 130-135, 137, 139-149, 151-158, 209-214, 218, and 219-228, 230-237 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

D. Whether claims 9, 88, and 167 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

E. Whether claims 10, 89, and 168 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

F. Whether claims 71, 150, and 229 are unpatentable under 35 U.S.C. § 102(e) in view of Maissel.

G. Whether claims 8, 87, and 166 are unpatentable under 35 U.S.C. § 103(a) in view of Maissel in view of Hendricks.

H. Whether claims 58, 137, and 216 are unpatentable under 35 U.S.C. § 103(a) in view of Maissel in view of Hendricks.

(vii.) Argument

A. The rejection of claims 1-6, 11, 13-28, 80-85, 89, 92-107, 159-164, 169, and 171-186 under 35 U.S.C. § 102(e) in view of Maissel

In the final Office Action dated March 22, 2007 ("Office Action"), the Examiner rejected independent claims 1, 80, and 159 under 35 U.S.C. § 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' independent claims 1, 80, and 159 are directed toward a method and systems for measuring audience size information based on playbacks of a recorded program. Indications of playbacks of the recorded program are received from a plurality of audience members. In response to receiving these indications, audience size information is updated and then provided to at least one user within an interactive television application.

Maissel refers to an electronic program guide in which a headend computes real-time information on a proportion or percentage of the audience viewing a program currently being viewed by a viewer, and a proportion or percentage of an audience currently viewing programs not currently being viewed by the viewer (*Maissel*, 19:20-23). The real time information may then be transmitted to the viewer and display information derived from the transmitted information may then be displayed on the display apparatus (*Maissel*, 19:27-30). The display information may comprise an alert to the viewer of the display apparatus informing the viewer that a program is currently being viewed by a large proportion of the audience (*Maissel*, 19:31-37). Maissel also includes an intelligent agent that receives

one or more viewer preference profiles and prepares customized program schedule information (*Maissel*, 18:60-67).

1. MAISSEL DOES NOT SHOW OR SUGGEST UPDATING AUDIENCE SIZE INFORMATION FOR RECORDED PROGRAMS

The initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). For a proper rejection under 35 U.S.C. § 102, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987). A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP 2131. Appellants respectfully submit that Maissel does not show each and every element of appellants' claims 1, 80, and 159.

In particular, Maissel does not show computing information about recorded programs. Maissel states in relevant part:

> ...at the headend 340, real-time information on a proportion or percentage of the audience viewing a particular program may be computed. The term 'audience', as used throughout the present specification and claims, refers either to the sum total audience viewing all programs at a particular time, or to the total audience of viewers who are capable of receiving programs at a particular time.
> *Maissel*, 19:20-27.

As shown in this passage, Maissel captures a real-time measure of the total audience viewing a particular program

at a particular time. Such a measure does not take into account recorded programs, which are programs that have been stored and played back after their broadcast. *See* appellants' specification, page 2, lines 13-21. Further, appellants respectfully submit that the Examiner's contention that indications of playbacks of a recorded program is equivalent to indications of the programs, or content, not currently being viewed by a viewer is overbroad. and unreasonable. For at least these reasons, Maissel does not show computing information about recorded programs.

As a result, Maissel also does not show updating audience size information for a recorded program in response to receiving indications of playbacks of the recorded program from audience members. On page 3 of the Office Action, the Examiner argues that:

> The Pay program, non-pay or free programs, popular programs (col. 12, line 67), movies and NVOD (col. 19, lines 1-49), etc., are all recorded programs and the monitoring agent monitors viewers [sic] behavior, actions or indications as to playbacks of these recorded programs at the headend, generates these analysis for presentation to at least one viewer (col. 19, lines 1-49).

Even assuming, *arguendo*, that all of the programs mentioned in this passage of the Office Action can be considered recorded programs, there is nothing in Maissel that shows using its monitoring agent to calculate audience information. Instead, the monitoring agent of Maissel uses monitored viewing behavior to generate on-screen alerts and display customized program schedule information. Accordingly, Maissel does not update audience size information for a recorded program in response to receiving

indications of playbacks of the recorded program from audience members as required by independent claims 1, 80, and 159.

2. CONCLUSION

For at least the above reasons, Maissel does not explicitly or implicitly show updating audience size information for a recorded program in response to receiving indications of playbacks of the recorded program from audience members. Accordingly, because Maissel fails to show each and every limitation of appellants' independent claims 1, 80, and 159, as is required for a rejection under 35 U.S.C. § 102(e), the Examiner's rejection is improper. Reversal of the rejection of claims 1, 80, and 159 is therefore respectfully requested. Appellants further submit that the board should also reverse the rejection of claims 2-6, 8-11, 13-28, 81-85, 87-90, 91-108, 160-164, 166-169, and 171-186 at least because these claims depend from independent claims 1, 80, and 159 respectively. See In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988) at 1600.

B. The rejection of claims 29-46, 50, 108-125,129,187-204, and 208 under 35 U.S.C. § 102(e)in view of Maissel

In the Office Action, the Examiner rejected independent claims 29, 108, and 187 under 35 U.S.C. § 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' independent claims 29, 108, and 187 are directed toward a method and systems for providing audience size information with program listings in an interactive television application. Indications that a

user wishes to access one or more program listings are received from a user. Audience size information for a program corresponding to at least one of the program listings is calculated. The calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members. Program listings that include audience size information are provided in response to the indication from the user.

1. MAISSEL DOES NOT SHOW OR SUGGEST CALCULATING AUDIENCE SIZE INFORMATION BY ASSIGNING POINTS TO USER ACTIONS

Appellants respectfully submit that Maissel does not show each and every element of appellants' claims. Specifically, Maissel does not show or suggest calculating audience size information based on a graded approach of "assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members" as required by appellants' claims 29, 108, and 187. Nowhere does Maissel show this functionality as part of its intelligent agent, preference profiles, calculation of audience size information, or any other feature. On page 3 of the Office Action, the Examiner contends that Maissel:

> "further uses rule-based abstracted method [sic] to generate various on-screen alerts to display behavior data or audience data of current programs being watched and programs not being watched (which meets the claim limitation 'calculating audience size information...based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by...audience members...')"

Appellants respectfully submit that the Examiner's characterization of Maissel is erroneous, and that Maissel does not show or suggest this feature of appellants' claims.

Maissel maintains preference profiles, which are collections of information that describe a user's viewing habits. An intelligent agent applies rules to this information to generate on-screen alerts to, *inter alia*, remind viewers that their favorite program is being broadcast and display customized program schedule information (*See* Maissel, col. 13, line 9 through col. 14, line 20, and col. 18, lines 58-67). Appellants respectfully submit that the Examiner's contention that these or any other features of Maissel show calculating audience size information based on a graded approach of assigning points to user actions is clearly false. Nowhere does Maissel show that the intelligent agent's "rule-based abstracted method" assigns points to audience actions for use in audience measurement.

Even if Maissel's "rule-based abstracted approach" assigned points to audience actions, which appellants maintain that it does not, Maissel still would not show that this feature is used for audience measurement. Maissel's intelligent agent is merely used to alert users of programs based on the information in their preference profiles. For example:

> a rule might state that if the user preference level for news is greater than a given threshold and if a news program is scheduled within the next 30 minutes, a news alert should be presented on the screen. See Maissel, col. 13, lines 2629.

Such rule based alerts have nothing to do with calculating audience sized information based on assigning points to user actions, and nowhere does Maissel associate the two concepts. Accordingly, Maissel does not show or suggest calculating audience size information based on a graded approach of "assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members" as required by appellants' claims 29, 108, and 187.

2. MAISSEL'S INTELLIGENT AGENT DOES NOT INHERENTLY SHOW CALCULATING AUDIENCE SIZE INFORMATION FROM USER VIEWING HABITS

On pages 2-3 of the Office Action, the Examiner cites several portions of Maissel related to Maissel's intelligent agent in an attempt to support his position:

> Examiner, notes applicant's argues [sic], however, Maissel discloses a monitoring agent that monitors viewing behavior of user [sic]...generates customizes [sic] schedule for viewers and provides audiences [sic] information to viewers with respect to programs currently being watch [sic] or not watched...Furthermore the viewing behavior includes various viewer actions...

Here, the Examiner appears to be implying that Maissel's intelligent agent inherently shows calculating audience size information from user viewing habits. According to MPEP 2112 (IV), "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." (emphasis in original). A claim limitation is inherent in the prior art if it is necessarily present in the prior art, not merely

probably or possibly present. Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc., 344 F.3d 1186, 68 USPQ2d 1186 (Fed. Cir. 2003) (emphasis added).

As discussed in section (vii.)(A)(1) of this brief, there is simply no disclosure in Maissel that its intelligent agent calculates audience size information from user viewing habits. Further, even assuming *arguendo* that it is possible for Maissel to use its intelligent agent to calculate audience size information, the Examiner has failed to provide any evidence that Maissel necessarily performs this function. For at least these reasons, Maissel does not explicitly or implicitly show calculating audience size information from user viewing habits collected by its intelligent agent.

3. CONCLUSION

Because Maissel fails to show each and every limitation of appellants' independent claims 29, 108, and 187, as is required for a rejection under 35 U.S.C. § 102(e), the Examiner's rejection is improper. Reversal of the rejection of claims 29, 108, and 187 is therefore respectfully requested. Appellants further submit that the board should also reverse the rejection of claims 30-46, 50, 109-125, 129, 188-204, and 208 at least because these claims depend from independent claims 29, 108, and 187 respectively. See In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988) at 1600.

C. The rejection of claims 51-56, 58, 60-70, 72-79,130-135, 137, 139-149, 151-158, 209-214, 218, 219-228, and 230-237 under 35 U.S.C. § 102(e) in view of Maissel

In the final Office Action, the Examiner rejected independent claims 51, 130, and 209 under 35 U.S.C.

§ 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' independent claims 51, 130 and 209 are directed toward methods and systems for measuring audience size information for an upcoming program in an interactive application. Indications to perform actions related to the upcoming program are received from a plurality of audience members. Audience size information is updated in response to receiving the indications. Audience size information is then provided to at least one user within the interactive television application.

1. MAISSEL DOES NOT SHOW OR SUGGEST UPDATING AUDIENCE SIZE INFORMATION FOR UPCOMING PROGRAMS

As argued in section (vii.)(A)(1) of this brief, Maissel updates audience information based only on programs currently being broadcast. Maissel makes no reference to providing such information for an upcoming program. In addition, as argued in section (vii.)(B)(2) of this brief, Maissel does not explicitly or implicitly show calculating audience size information from user viewing habits collected by its intelligent agent. Therefore, Maissel does not show updating audience size information based on users viewing upcoming programs. For at least this reason, Maissel fails to show all of the features of appellants' independent claims 51, 130, and 209.

2. THE EXAMINER'S REJECTION DOES NOT ADDRESS APPELLANTS' CLAIMED FEATURE OF UPDATING AUDIENCE SIZE INFORMATION BASED ON USERS VIEWING UPCOMING PROGRAMS

Appellants respectfully submit that the Office Action does not address appellants' claimed feature of updating audience size information based on users viewing upcoming programs. On page 10 of the Office Action, the Examiner contends that Maissel further discloses "measuring audience information for upcoming program [sic] in an interactive application..." as previously discussed with respect to the rejection of claim 1. However, in the rejection of claim 1, there is no such discussion of where Maissel shows this feature. The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Appellants respectfully submit that the Examiner has failed to meet this burden. As such, the Examiner's rejection of claims 51, 130, and 209 is improper. Reversal of the rejection of claims 51, 130, and 209 is therefore respectfully requested.

3. CONCLUSION

For at least the reasons above, the Examiner's rejection of claims 51, 130, and 209 should be withdrawn. Appellants further submit that the board should also reverse the rejection of claims 52-59, 58, 60-70, 72-79, 131-135, 137, 139-149, 151-158, 210-214, 218, 219-228, and 230-237 at least because these claims depend from independent claims 51, 130, and 209 respectively. See In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988) at 1600.

D. The rejection of claims 9, 88, and 167 under 35 U.S.C. § 102(e) in view of Maissel

In the March 22, 2007 Office Action, the Examiner rejected dependent claims 9, 88, and 167 under 35 U.S.C.

§ 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' dependent claims 9, 88, and 167 are directed towards a method and systems for updating audience size information based on the number of times each audience member plays back a recorded program.

On page 6 of the Office Action, the Examiner cites to 2 portions of Maissel to allegedly show this claimed feature. The first section, col. 11, lines 8-64, relates to a description of how Maissel receives program schedule information. The second section, col. 19, lines 1-49, relates to how Maissel calculates audience size information using the headend, and how the audience information may be displayed. None of these portions of Maissel show or suggest updating audience size information based on the number of times each audience member plays back a recorded program. While the first portion of Maissel cited by the Examiner mentions Maissel's intelligent agent, as argued in section (vii.)(B)(2) of this brief, Maissel does not explicitly or implicitly show calculating audience size information from user viewing habits collected by its intelligent agent Accordingly, nowhere does Maissel show or suggest appellants claims 9, 88, and 167.

For at least these additional reasons, appellants submit that the Board should reverse the rejection of dependent claims 9, 88, and 167 under 35 U.S.C. § 102(e) as being unpatentable in view of Maissel.

E. The rejection of claims 10, 89, and 168 under 35 U.S.C. § 102(e) in view of Maissel

In the March 22, 2007 Office Action, the Examiner rejected dependent claims 10, 89, and 168 under 35 U.S.C. § 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants dependent claims 10, 89, and 168 are directed towards a method and systems for, *inter alia*, updating audience size information based on a user-identified action. For example, actions may include the user pausing, rewinding, and fast-forwarding media (*See* appellants' specification, page 36, line 34 through page 37, line 15).

On pages 6, 10, and 13 of the March 22, 2007 Office Action, the Examiner contends that 4 cited portions of Maissel, each detailing Maissel's intelligent agent, shows this feature of appellants' claims. However, as argued in section (vii.)(B)(2) of this brief, Maissel does not explicitly or implicitly show calculating audience size information from user viewing habits collected by its intelligent agent. Accordingly, nowhere does Maissel show or suggest appellants claims 10, 89, and 168.

For at least these additional reasons, appellants submit that the Board should reverse the rejection of dependent claims 10, 89, and 168 under 35 U.S.C. § 102(e) as being unpatentable in view of Maissel.

F. The rejection of claims 71, 150, and 229 under 35 U.S.C. § 102(e) in view of Maissel

In the March 22, 2007 Office Action, the Examiner rejected dependent claims 71, 150, and 229 under 35 U.S.C.

§ 102(e) as being unpatentable in view of Maissel. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' dependent claims 71, 150, and 229 are directed towards a method and systems for updating audience size information based on the number of times the plurality of audience members perform actions related to an upcoming program.

On pages 7, 12, and 13 of the Office Action, the Examiner contends that claims 71, 150, and 229 are rejected as previously discussed with respect to claims 9-11. In the rejections of these claims, the Examiner cites portions of Maissel that discuss how Maissel receives program schedule information, how Maissel calculates audience size information using the headend, how the audience information may be displayed, and the operation of Maissel's intelligent agent. None of these portions of Maissel show or suggest updating audience size information relating to an upcoming program, let alone discuss an upcoming program itself. Further, as argued in section (vii.)(C)(1) of this brief, Maissel does not show updating audience size information based on users viewing upcoming programs. Accordingly, nowhere does Maissel show or suggest appellants claims 71, 150, and 229.

G. The rejection of claims 8, 87, and 166 under 35 U.S.C. § 103(a) in view of Maissel in view of Hendricks

In the March 22, 2007 Office Action, the Examiner rejected dependent claims 8, 87, and 166 under 35 U.S.C. § 103(a) as being unpatentable in view of Maissel in view of Hendricks. Appellants respectfully traverse this

rejection and request that it be overturned for at least the reasons set forth below.

Appellants' dependent claims 8, 87, and 166 are directed towards a method and systems for, inter alia, updating a market share of a recorded program.

On page 16 of the Office Action, the Examiner concedes that Maissel fails to show or suggest updating a market share of a recorded program but contends that Hendricks discusses analyzing television show ratings to determine optimal scheduling in order to gain market share.

Hendricks refers to an Operations Center that organizes and packages television programs for transmission in a television delivery system (*Hendricks*, 3:12-16). The Operations Center packages programs into groups that provide the optimal marketing of the programs to subscribers (*Hendricks*, 8:11-14). The packaging tasks are performed by computer assisted packaging equipment (CAP), which may utilizing ratings data (*Hendricks*, 8:22-31).

The Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Maissel with Hendricks in order to gain market share by providing interesting programs. However, Hendricks does not show or suggest updating a market share of a recorded program. Instead, Hendricks discusses a system that may be used to increase market share by optimally packaging video programs. The appellants' claims, on the other hand, refer to updating a market share as part of an update to the audience size information. Accordingly, the combination of Maissel and Hendricks does not show or suggest appellants' claims 8, 87, and 166.

H. The rejection of claims 58, 137, and 216 under 35 U.S.C. § 103(a) in view of Maissel in view of Hendricks

In the March 22, 2007 Office Action, the Examiner rejected dependent claims 58, 137, and 216 under 35 U.S.C. § 103(a) as being unpatentable in view of Maissel in view of Hendricks. Appellants respectfully traverse this rejection and request that it be overturned for at least the reasons set forth below.

Appellants' dependent claims 58, 137, and 216 are directed towards a method and systems for, inter alia, updating a market share of an upcoming program.

On page 16 of the Office Action, the Examiner concedes that Maissel fails to show or suggest updating a market share of an upcoming program but contends that Hendricks discusses analyzing television show ratings to determine optimal scheduling in order to gain market share. The Examiner further alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Maissel with Hendricks in order to gain market share by providing interesting programs.

Appellants respectfully submit that Hendricks does not show or suggest updating a market share of an upcoming program. Instead, Hendricks discusses a system that may be used to increase market share by optimally packaging video programs. The appellants' claims, on the other hand, refer to updating a market share as part of an update to the audience size information. Accordingly, the combination of Maissel and Hendricks does not show or suggest appellants' claims 58, 137, and 216.

I. Conclusion

For the reasons set forth above, appellants submit that claims 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 are in condition for allowance. The Examiner's rejections of these claims should be reversed.

Respectfully submitted,

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(viii.) Claims Appendix

CLAIMS 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, AND 218-237 ON APPEAL

1. (previously presented) A method for measuring audience size information based on playbacks of a recorded program comprising:

receiving indications of playbacks of the recorded program from a plurality of audience members;

updating audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and

providing the updated audience size information to at least one user within an interactive television application.

2. (original) The method defined in claim 1 wherein the recorded program is an audio program.

3. (original) The method defined in claim 1 wherein the recorded program is a television program.

4. (original) The method defined in claim 1 wherein the recorded program is a pay-per-view program.

5. (original) The method defined in claim 1 wherein the recorded program is a video-on-demand program.

6. (original) The method defined in claim 1 wherein the recorded program is a near-video-on-video program.

7. (cancelled)

8. (previously presented) The method defined in claim 1 wherein updating audience size information comprises updating a market share of the recorded program.

9. (previously presented) The method defined in claim 1 wherein updating audience size information comprises updating audience size information based on the number of times each audience member played back the recorded program.

10. (previously presented) The method defined in claim 1 further comprising:

receiving an indication for a user-identified action, wherein such action controls how the recorded program is played back;

executing the user-identified action in response to receiving the indication; and

updating audience size information based on the user-identified action.

11. (original) The method defined in claim 10 wherein the user-identified action comprises actions selected from the group consisting of fast-forward, rewind, stop, pause, record, and play.

12. (cancelled)

13. (previously presented) The method defined in claim 1 wherein the interactive television application is an interactive television program guide.

14. (previously presented) The method defined in claim 1 wherein providing the audience size information comprises providing an interactive indicator that notifies the at least one user when audience size information is available, wherein the interactive indicator comprises content selected from the group consisting of text, graphics, audio, video, and animation.

15. (previously presented) The method defined in claim 1 further comprising allowing the at least one user to compare programs based on audience size information provided to the at least one user for the programs.

16. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information for a portion of the recorded program.

17. (original) The method defined in claim 16 wherein the portion of the recorded program is a scene within the recorded program.

18. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information for a genre of programs.

19. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information for the recorded program based on a time slot.

20. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing audience size information for a subset of the plurality of audience members to the at least one user.

21. (previously presented) The method defined in claim 20 wherein the subset of the plurality of audience members is defined based on user demographics.

22. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information to the at least one user in a flip display.

23. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information to the at least one user in a browse display.

24. (previously presented) The method defined in claim 1 wherein providing the audience size information further comprises providing the audience size information to the at least one user in a program listings display.

25. (previously presented) The method defined in claim 1 wherein updating the audience size information further comprises updating the audience size information based on a user profile of an audience member from which an indication was received related to the playback of the recorded program.

26. (previously presented) The method defined in claim 1 wherein updating audience size information further comprises calculating audience size for the recorded program.

27. (original) The method defined in claim 26 wherein calculating the audience size comprises calculating the audience size based on assigning points to playback information.

28. (original) The method defined in claim 26 wherein calculating the audience size further comprises accessing a table of grading information for assigning points to playback information.

29. (previously presented) A method for providing audience size information with program listings in an interactive television application comprising:

receiving an indication from a user that the user wishes to access one or more program listings;

calculating audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions [[of]] performed by a plurality of audience members; and

providing the one or more program listings in response to the indication, wherein at least one of the one or more program listings includes audience size information for a program corresponding to a program listing.

30. (original) The method defined in claim 29 wherein the program is an audio program.

31. (original) The method defined in claim 29 wherein the program is a television program.

32. (original) The method defined in claim 29 wherein the program is a pay-per-view program.

33. (original) The method defined in claim 29 wherein the program is a video-on-demand program.

34. (original) The method defined in claim 29 wherein the program is a near-video-on-video program.

35. (previously presented) The method defined in claim 29 wherein the providing the one or more program listings comprises providing an interactive indicator that notifies the user when audience size information is available, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

36. (previously presented) The method defined in claim 29 further comprising allowing the user to compare programs based on audience size information provided to the user for the programs.

37. (previously presented) The method defined in claim 29 further comprising providing audience size information for a portion of the program.

38. (original) The method defined in claim 37 wherein the portion of the program is a scene within the program.

39. (previously presented) The method defined in claim 29 further comprising providing audience size information for a genre of programs.

40. (previously presented) The method defined in claim 29 further comprising providing the audience size information for the program based on a time slot.

41. (previously presented) The method defined in claim 29 further comprising providing the audience size information for a subset of the plurality of audience members to the user.

42. (previously presented) The method defined in claim 41 wherein the subset of the plurality of audience members is defined based on user demographics.

43. (previously presented) The method defined in claim 29 further comprising providing audience size information to the user in a flip display.

44. (previously presented) The method defined in claim 29 further comprising providing audience size information to the user in a browse display.

45. (previously presented) The method defined in claim 29 further comprising providing audience size information to the user in a program listings display.

46. (previously presented) The method defined in claim 29 further comprising updating audience size information based on a user profile of an audience member from which an indication was received.

47-49. (cancelled)

50. (original) The method defined in claim 29 wherein the interactive television application is an interactive television program guide.

51. (previously presented) A method for measuring audience size information for an upcoming program in an interactive application comprising:

receiving indications from a plurality of audience members to perform actions related to the upcoming program;

updating audience size information for the upcoming program in response to receiving the indications; and

providing the audience size information to at least one user within the interactive television application.

52. (original) The method defined in claim 51 wherein the upcoming program is an audio program.

53. (original) The method defined in claim 51 wherein the upcoming program is a television program.

54. (original) The method defined in claim 51 wherein the upcoming program is a pay-per-view program.

55. (original) The method defined in claim 51 wherein the upcoming program is a video-on-demand program.

56. (original) The method defined in claim 51 wherein the upcoming program is a near-video-on-video program.

57. (cancelled)

58. (previously presented) The method defined in claim 51 wherein updating audience size information comprises updating a market share of the upcoming program.

59. (cancelled)

60. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing an interactive indicator, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

61. (previously presented) The method defined in claim 51 further comprising allowing the user to compare programs based on audience size information provided to the user for the programs.

62. (previously presented) The method defined in claim 51 wherein providing the audience size information

further comprises providing the audience size information for a portion of the upcoming program.

63. (previously presented) The method defined in claim 51 wherein the portion of the upcoming program is a scene within the upcoming program.

64. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information for a genre of programs.

65. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information for the upcoming program based on a time slot.

66. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information for a subset of the plurality of audience members to the user.

67. (previously presented) The method defined in claim 66 wherein the subset of the plurality of audience members is defined based on user demographics.

68. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information to the user in a flip display.

69. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information to the user in a browse display.

70. (previously presented) The method defined in claim 51 wherein providing the audience size information further comprises providing the audience size information to the user in a program listings display.

71. (previously presented) The method defined in claim 51 wherein updating audience size information comprises updating the audience size information based on the number of times the plurality of audience members performed actions related to the upcoming program.

72. (previously presented) The method defined in claim 51 wherein updating the audience size information further comprises updating the audience size information based on the number of times that the plurality of audience members viewed program information related to the upcoming program.

73. (previously presented) The method defined in claim 51 wherein updating the audience size information further comprises updating the audience size information based on the number of times that the plurality of audience members purchased the upcoming program.

74. (previously presented) The method defined in claim 51 wherein updating the audience size information further comprises updating the audience size information

based on the number of times that the plurality of audience members set reminders for the upcoming program.

75. (previously presented) The method defined in claim 51 wherein updating the audience size information further comprises updating the audience size information based on the number of times that the plurality of audience members scheduled to record the upcoming program.

76. (previously presented) The method defined in claim 51 wherein updating the audience size information further comprises updating the audience size information based on a user profile of an audience member from which an indication was received related to the upcoming program.

77. (previously presented) The method defined in claim 51 further comprising calculating audience size information for the upcoming program.

78. (previously presented) The method defined in claim 77 wherein calculating the audience size information comprises calculating the audience size information based on assigning points to playback information.

79. (previously presented) The method defined in claim 77 wherein calculating the audience size information further comprises accessing a table of grading information for assigning points to playback information.

80. (previously presented) A system for measuring audience size information based on playbacks of a recorded program comprising:

means for receiving indications of playbacks of the recorded program from a plurality of audience members;

means for updating audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and

means for providing the updated audience size information to at least one user within an interactive television application.

81. (original) The system defined in claim 80 wherein the recorded program is an audio program.

82. (original) The system defined in claim 80 wherein the recorded program is a television program.

83. (original) The system defined in claim 80 wherein the recorded program is a pay-per-view program.

84. (original) The system defined in claim 80 wherein the recorded program is a video-on-demand program.

85. (original) The system defined in claim 80 wherein the recorded program is a near-video-on-video program.

86. (cancelled)

87. (previously presented) The system defined in claim 80 wherein the means for updating audience size information comprises means for updating a market share of the recorded program.

88. (previously presented) The system defined in claim 80 wherein the means for updating audience size information comprises means for updating audience size information based on the number of times each audience member played back the recorded program.

89. (previously presented) The system defined in claim 80 further comprising:

means for receiving an indication for a user-identified action, wherein such action controls how the recorded program is played back;

means for executing the user-identified action in response to receiving the indication; and

means for updating audience size information based on the user-identified action.

90. (original) The system defined in claim 89 wherein the user-identified action comprises actions selected from the group consisting of fast-forward, rewind, stop, pause, record, and play.

91. (cancelled)

92. (previously presented) The system defined in claim 80 wherein the interactive television application is an interactive television program guide.

93. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing an interactive indicator, wherein the interactive indicator

comprises content selected from the group consisting of text, graphics, audio, video, and animation.

94. (previously presented) The system defined in claim 80 further comprising means for allowing the at least one user to compare programs based on audience size information provided to the at least one user for the programs.

95. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing the audience size information for a portion of the recorded program.

96. (original) The system defined in claim 95 wherein the portion of the recorded program is a scene within the recorded program.

97. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing the audience size information for a genre of programs.

98. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing the audience size information for the recorded program based on a time slot.

99. (previously presented) The system defined in claim 80 wherein the means for providing the audience size

information further comprises providing audience size information for a subset of the plurality of audience members to the at least one user.

100. (previously presented) The system defined in claim 99 wherein the subset of the plurality of audience members is defined based on user demographics.

101. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing the audience size information to the at least one user in a flip display.

102. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing the audience size information to the at least one user in a browse display.

103. (previously presented) The system defined in claim 80 wherein the means for providing the audience size information further comprises means for providing audience size information to the at least one user in a program listings display.

104. (previously presented) The system defined in claim 80 wherein the means for updating the audience size information further comprises means for updating the audience size information based on a user profile of an audience member from which an indication was received related to the playback of the recorded program.

105. (previously presented) The system defined in claim 80 wherein the means for updating audience size information further comprises means for calculating audience size for the recorded program.

106. (original) The system defined in claim 105 wherein the means for calculating the audience size comprises means for calculating the audience size based on assigning points to playback information.

107. (original) The system defined in claim 105 wherein the means for calculating the audience size further comprises means for accessing a table of grading information for assigning points to playback information.

108. (previously presented) A system for providing audience size information with program listings in an interactive television application comprising:

means for receiving an indication from a user that the user wishes to access one or more program listings;

means for calculating audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions [[of]] performed by a plurality of audience members; and

means for providing the one or more program listings in response to the indication, wherein at least one of the one or more program listings includes audience

size information for a program corresponding to a program listing.

109. (original) The system defined in claim 108 wherein the program is an audio program.

110. (original) The system defined in claim 108 wherein the program is a television program.

111. (original) The system defined in claim 108 wherein the program is a pay-per-view program.

112. (original) The system defined in claim 108 wherein the program is a video-on-demand program.

113. (original) The system defined in claim 108 wherein the program is a near-video-on-video program.

114. (previously presented) The system defined in claim 108 wherein the means for providing the one or more program listings comprises means for providing an interactive indicator that notifies the user when audience size information is available, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

115. (previously presented) The system defined in claim 108 further comprising means for allowing the user to compare programs based on audience size information provided to the user for the programs.

116. (previously presented) The system defined in claim 108 further comprising means for providing audience size information for a portion of the program.

117. (original) The system defined in claim 116 wherein the portion of the program is a scene within the program.

118. (previously presented) The system defined in claim 108 further comprising means for providing audience size information for a genre of programs.

119. (previously presented) The system defined in claim 108 further comprising means for providing the audience size information for the program based on a time slot.

120. (previously presented) The system defined in claim 108 further comprising means for providing the audience size information for a subset of the plurality of audience members to the user.

121. (previously presented) The system defined in claim 120 wherein the subset of the plurality of audience members is defined based on user demographics.

122. (previously presented) The system defined in claim 108 further comprising means for providing audience size information to the user in a flip display.

123. (previously presented) The system defined in claim 108 further comprising means for providing audience size information to the user in a browse display.

124. (previously presented) The system defined in claim 108 further comprising means for providing audience size information to the user in a program listings display.

125. (previously presented) The system defined in claim 108 further comprising means for updating audience size information based on an audience member from which an indication was received.

126-128. (cancelled)

129. (original) The system defined in claim 108 wherein the interactive television application is an interactive television program guide.

130. (previously presented) A system for measuring audience size information for an upcoming program in an interactive application comprising:

means for receiving indications from a plurality of audience members to perform actions related to the upcoming program;

means for updating audience size information for the upcoming program in response to receiving the indications; and

means for providing the audience size information to at least one user within the interactive television application.

131. (original) The system defined in claim 130 wherein the upcoming program is an audio program.

132. (original) The system defined in claim 130 wherein the upcoming program is a television program.

133. (original) The system defined in claim 130 wherein the upcoming program is a pay-per-view program.

134. (original) The system defined in claim 130 wherein the upcoming program is a video-on-demand program.

135. (original) The system defined in claim 130 wherein the upcoming program is a near-video-on-video program.

136. (cancelled)

137. (previously presented) The system defined in claim 130 wherein the means for updating audience size information comprises means for updating a market share of the upcoming program.

138. (cancelled)

139. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing an interactive indicator that notifies the user when audience size information is available, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

140. (previously presented) The system defined in claim 130 further comprising means for allowing the user to compare programs based on audience size information provided to the user for the programs.

141. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information for a portion of the upcoming program.

142. (previously presented) The system defined in claim 130 wherein the portion of the upcoming program is a scene within the upcoming program.

143. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information for a genre of programs.

144. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information for the upcoming program based on a time slot.

145. (previously presented) The system defined in claim 130 wherein the means for providing audience size information further comprises means for providing audience size information for a subset of the plurality audience members to the user.

146. (previously presented) The system defined in claim 145 wherein the subset of the plurality of audience members is defined based on user demographics.

147. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information to the user in a flip display.

148. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information to the user in a browse display.

149. (previously presented) The system defined in claim 130 wherein the means for providing the audience size information further comprises means for providing the audience size information to the user in a program listings display.

150. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on the number of times the plurality of audience members performed actions related to the upcoming program.

151. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on the number of times that

the plurality of audience members viewed program information related to the upcoming program.

152. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on the number of times that the plurality of audience members purchased the upcoming program.

153. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on the number of times that the plurality of audience members set reminders for the upcoming program.

154. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on the number of times that the plurality of audience members scheduled to record the upcoming program.

155. (previously presented) The system defined in claim 130 wherein the means for updating the audience size information further comprises means for updating the audience size information based on a user profile of an audience member from which an indication was received related to the upcoming program.

156. (previously presented) The system defined in claim 130 further comprising means for calculating audience size information for the upcoming program.

157. (previously presented) The system defined in claim 156 wherein the means for calculating the audience size information comprises means for calculating the audience size information based on assigning points to playback information.

158. (previously presented) The system defined in claim 156 wherein the means for calculating the audience size information further comprises means for accessing a table of grading information for assigning points to playback information.

159. (previously presented) A system for measuring audience size information based on playbacks of a recorded program comprising:

a user input device;

a display device; and

an interactive television application implemented at least partially on control circuitry and programmed to:

receive indications of playbacks of the recorded program from a plurality of audience members;

update audience size information for the recorded program in response to receiving the indications from the plurality of audience members; and

direct the display device to provide the updated audience size information to at least one user within an interactive television application.

160. (original) The system defined in claim 159 wherein the recorded program is an audio program.

161. (original) The system defined in claim 159 wherein the recorded program is a television program.

162. (original) The system defined in claim 159 wherein the recorded program is a pay-per-view program.

163. (original) The system defined in claim 159 wherein the recorded program is a video-on-demand program.

164. (original) The system defined in claim 159 wherein the recorded program is a near-video-on-video program.

165. (cancelled)

166. (original) The system defined in claim 159 wherein the interactive television application is further programmed to update a market share of the recorded program.

167. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to update audience size information based on the number of times each audience member played back the recorded program.

168. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to:

receive an indication for a user-identified action from the user input device, wherein such action controls how the recorded program is played back;

execute the user-identified action in response to receiving the indication; and

update audience size information based on the user-identified action.

169. (original) The system defined in claim 168 wherein the user-identified action comprises actions selected from the group consisting of fast-forward, rewind, stop, pause, record, and play.

170. (cancelled)

171. (previously presented) The system defined in claim 159 wherein the interactive television application is an interactive television program guide.

172. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide an interactive indicator, wherein the interactive indicator comprises content selected from the group consisting of text, graphics, audio, video, and animation.

173. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to allow the at least one user to

compare programs based on audience size information provided to the at least one user for the programs.

174. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a portion of the recorded program.

175. (original) The system defined in claim 174 wherein the portion of the recorded program is a scene within the recorded program.

176. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a genre of programs.

177. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information for the recorded program based on a time slot.

178. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to:

provide the audience size information for a subset of a plurality of audience members to the at least one user.

179. (previously presented) The system defined in claim 178 wherein the subset of the plurality of audience members is defined based on user demographics.

180. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the at least one user in a flip display.

181. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the at least one user in a browse display.

182. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the at least one user in a program listings display.

183. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to update audience size information based on a user profile of an audience member from which an indication was received related to the playback of the recorded program.

184. (previously presented) The system defined in claim 159 wherein the interactive television application is further programmed to calculate audience size.

185. (previously presented) The system defined in claim 184 wherein the interactive television application is further programmed to calculate the audience size information based on assigning points to playback information.

186. (original) The system defined in claim 184 wherein the interactive television application is further programmed to access a table of grading information for assigning points to playback information.

187. (previously presented) A system for providing audience size information with program listings in an interactive television application comprising:

a user input device;

a display device; and

an interactive television application implemented at least partially on control circuitry and programmed to:

receive an indication from the user input device that a user wishes to access one or more program listings;

calculate audience size information for a program corresponding to at least one of the one or more program listings, wherein the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions [[of]] performed by a plurality of audience members; and

direct the display device to provide the one or more program listings in response to the indication, wherein at least one of the one or more program

listings includes audience size information for a program corresponding to a program listing.

188. (original) The system defined in claim 187 wherein the program is an audio program.

189. (original) The system defined in claim 187 wherein the program is a television program.

190. (original) The system defined in claim 187 wherein the program is a pay-per-view program.

191. (original) The system defined in claim 187 wherein the program is a video-on-demand program.

192. (original) The system defined in claim 187 wherein the program is a near-video-on-video program.

193. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide an interactive indicator that notifies the user when audience size information is available, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

194. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to allow the user to compare programs based on audience size information provided to the user for the programs.

195. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a portion of the program.

196. (original) The system defined in claim 195 wherein the portion of the program is a scene within the program.

197. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a genre of programs.

198. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to provide the audience size information for the program based on a time slot.

199. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a subset of the plurality of audience members to the user.

200. (previously presented) The system defined in claim 199 wherein the subset of the plurality of audience members is defined based on user demographics.

201. (previously presented) The system defined in claim 187 wherein the interactive television application is

further programmed to direct the display device to provide audience size information to the user in a flip display.

202. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the user in a browse display.

203. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the user in a program listings display.

204. (previously presented) The system defined in claim 187 wherein the interactive television application is further programmed to update audience size information based on a user profile of an audience member from which an indication was received.

205-207. (cancelled)

208. (original) The system defined in claim 187 wherein the interactive television application is an interactive television program guide.

209. (previously presented) A system for measuring audience size information for an upcoming program in an interactive television application comprising:

a user input device; and

an interactive television application implemented at least partially on control circuitry and programmed to:

receive indications from a plurality of audience members to perform actions related to the upcoming program;

update audience size information for the upcoming program in response to receiving the indications; and

direct to display device to provide the audience size information to at least one user within the interactive television application.

210. (original) The system defined in claim 209 wherein the upcoming program is an audio program.

211. (original) The system defined in claim 209 wherein the upcoming program is a television program.

212. (original) The system defined in claim 209 wherein the upcoming program is a pay-per-view program.

213. (original) The system defined in claim 209 wherein the upcoming program is a video-on-demand program.

214. (original) The system defined in claim 209 wherein the upcoming program is a near-video-on-video program.

215. (cancelled)

216. (original) The system defined in claim 209 wherein the interactive television application is further programmed to update a market share of the upcoming program.

217. (cancelled)

218. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide an interactive indicator that notifies the user when audience size information is available, wherein the interactive indicator comprises content selected form the group consisting of text, graphics, audio, video, and animation.

219. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to allow the user to compare programs based on audience size information provided to the user for the programs.

220. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a portion of the upcoming program.

221. (previously presented) The system defined in claim 209 wherein the portion of the upcoming program is a scene within the upcoming program.

222. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a genre of programs.

223. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide the audience size information for the upcoming program based on a time slot.

224. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information for a subset of the plurality audience members to the user.

225. (previously presented) The system defined in claim 224 wherein the subset of the plurality of audience members is defined based on user demographics.

226. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the user in a flip display.

227. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the user in a browse display.

228. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to direct the display device to provide audience size information to the user in a program listings display.

229. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update the audience size information based on the number of times the plurality of audience members performed actions related to the upcoming program.

230. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update the audience size information based on the number of times that the plurality of audience members viewed program information related to the upcoming program.

231. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update the audience size information based on the number of times that the plurality of audience members purchased the upcoming program.

232. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update the audience size information based on the number of times that the plurality of audience members set reminders for the upcoming program.

233. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update the audience size information based on the number of times that the plurality of audience members scheduled to record the upcoming program.

234. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to update audience size information based on a user profile of an audience member from which an indication was received related to the upcoming program.

235. (previously presented) The system defined in claim 209 wherein the interactive television application is further programmed to calculate audience size information for the upcoming program.

236. (previously presented) The system defined in claim 235 wherein the interactive television application is further programmed to calculate the audience size information based on assigning points to playback information.

237. (original) The system defined in claim 235 wherein the interactive television application is further programmed to access a table of grading information for assigning points to playback information.

(ix.) Evidence Appendix

COPY OF THE FINAL OFFICE ACTION DATED MARCH 22, 2007

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,705	03/30/2001	David M. Berezowski	UV-193	7437

1473 7590 03/22/2007
FISH & NEAVE IP GROUP
ROPES & GRAY LLP
1211 AVENUE OF THE AMERICAS
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EXAMINER	
SHANG, ANNAN Q	
ART UNIT	PAPER NUMBER
2623	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

RECEIVED
MAR 27 2007
ROPES & GRAY LLP PATENT DEPT
REFERRED TO
NOTED BY

File No UV193
Action Desc Resp to final O/A
Due Date June 22, 2007
By

File No. UV193
Action Desc Notice of Appeal Due
Due Date Sept. 22, 2007
By

Reporting email sent to client on
3/30/07

Office Action Summary	Application No.	Applicant(s)	
	09/823,705	BEREZOWSKI ET AL.	
	Examiner	Art Unit	
	Annan Q. Shang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/6/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1-6,8-11,13-46,50-56,58,60-85,87-90,92-125,129-135,137,139-164,166-169,171-204,208-214,216 and 218-237.

Continuation of Disposition of Claims: Claims rejected are 1-6,8-11,13-46,50-56,58,60-85,87-90,92-125,129-135,137,139-164,166-169,171-204,208-214,216 and 218-237.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 12/21/06 have been fully considered but they are not persuasive.

With respect to claims 1-6, 9-11, 13-46, 50-56, 60-85, 88-90, 92-135, 139-164, 167-169, 171-204, 208-214, 218-237 are rejected under 35 U.S.C. 102(e) as being anticipated by **Maissel et al (6,637,029),** and claims 8, 58, 87, 137, 166 and 216 rejected under 35 U.S.C. 103(a) as being unpatentable over **Maissel et al (6,637,029)** in view of **Hendricks et al (6,539,548),** applicant discusses the claimed invention and parts of the disclosure which are not in the claim limitations and further argues, with respect to independent claims 1, 29, 108 and 187, that "...Maissel does not show providing audience information for recorded programming..." that "...only refers to providing audience size information based only on programs currently broadcast..." that "...Maissel does not show or suggest all of the elements of independent claim 29...assigning a predetermined quality of points to actions of audience members to more accurately calculate audience size information..." that "...user's selected actions with...(PVR) device.." etc., and further argues with respect to independent claims 51, 130 and 209 that "...Maissel does not show updating audience size information based on users viewing upcoming programs..." (see page labeled 2+ of applicant's Remarks).

In response, Examiner disagrees. Examiner, notes applicant's argues, however, Maissel discloses a monitoring agent that monitors viewing behavior of user with respect to pay TV systems and non-pay or free TV systems (col.2, line 65-col.3, line 8

and col.19, lines 1-15), generates customizes schedule for viewers and provides audiences information to viewers with respect to programs currently being watch or not watched (col.5, line 56-col.6, line 18, col.8, lines 30-45 and col.19, lines 1-15). The Pay program, non-pay or free programs, popular programs (col.12, line 67), movies and NVOD (col.19, lines 1-15), etc., are all recorded programs and the monitoring agent monitors viewers behavior, actions or indications as to playbacks of these recorded programs at the headend, generates these analysis for presentation to at least one viewer (col.19, lines 1-49). Furthermore the viewing behavior data includes various viewer actions, such as, length of portions of viewed programs, preference strength (how strongly a certain program or type of program is preferred), percentage of all occurrences of the programs that were viewed, channel surfing behavior (actions of the viewers), where the viewer behavior data is determined based on these actions, compared to a predetermined threshold (col.4, lines 30-51 and col.8, lines 30-45) and further uses rule-base abstracted method to generate various on-screen alerts to display behavior data or audience data of current programs being watched and programs not being watched (which meets the claim limitation "calculating audience size information…based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by…audience members…"). Maissel further discloses that the audience viewing information includes "…indication of a proportion of an audience currently viewing a program…the program includes a program currently being viewed by a viewer…the program includes a program not currently being viewed by a viewer…"(col.5, line 51-col.6, line 19). With respect to

applicant's Remarks, as to user's selected actions, such as, playing, pausing, rewinding, etc., with PVR device, Examiner further notes applicant's remarks, however this limitation is not recited in the claim limitations. Hence, applicant's arguments are not persuasive, the 102(e) rejection of all the independent claims and their dependent claims, including the 103(a) rejection of other dependent claims, are proper, meet all the claim limitations, maintained as repeated below. **This office action is made Final**

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 9-11, 13-46, 50-56, 60-85, 88-90, 92-135, 139-164, 167-169, 171-204, 208-214, 218-237 are rejected under 35 U.S.C. 102(e) as being anticipated by **Maissel et al (6,637,029)** previously cited.

As to claims 1, 29 and 51, note the **Maissel** reference discloses figures 1-2 and 9, discloses an intelligent electronic program guide (EPG) and further discloses a method: for measuring audience information based on playbacks of a recorded program, for providing audience information with program listings in an interactive

television application, for measuring audience information for upcoming program in an interactive application, comprising,

A user input device (Remote Control, col.10, lines 54-62); A display device (Television, col.9, lines 59-col.10, line 21);

Receiving indications (Headend 'HE' 340) of playbacks of the recorded program from a plurality of audience members (figs.1, 8, 9, col.2, line 65-col.3, line 8, col.5, line 51-col.6, line 19, col.8, lines 30-45, col.18, lines 29-66 and col.19, lines 1-23);

Updating (HE-340) audience size information for the recorded program in response to receiving the indications from the plurality of audience members, where the calculating audience size information for a program corresponding to at least one of the one or more listings, where the calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members (col.5, line 51-col.6, line 19, col.8, line 30-45, col.13, lines 9-34, col.19, lines 16-49 and line 58-col.20, line 1+); and providing the providing the updated audience size information to at least one user within an interactive television application (col.5, line 51-col.6, line 19, col.8, line 30-45, col.19, lines 16-49 and line 58-col.20, line 1+), note that HE monitoring agent, monitors in real time basis information on a proportion or percentage of audiences viewing a particular program such as NVOD, MOVIE, etc., and transmits viewer behavior data or on-screen alerts information of proportion of an audience currently viewing the program and further transmits behavior data or on-screen alerts of a program not currently being viewed by a viewer,

in real-time to subscribers upon receiving and indications from the subscriber(s) as to the playbacks of recorded program.

As to claim 2, Maissel further discloses where the recorded program is audio program (col.10, lines 23-66, col.11, lines 8-64 and col.21, lines 34-64).

As to claim 3, Maissel further discloses where the recorded program is television program (col.10, lines 23-62 and col.11, lines 8-64).

As to claim 4, Maissel further discloses where the recorded program is PPV program (col.10, lines 23-62, col.11, lines 8-64 and col.19, lines 1-15).

As to claim 5, Maissel further discloses where the recorded program is VOD program (col.10, lines 23-62, col.11, lines 8-64 and col.19, lines 1-15).

As to claim 6, Maissel further discloses where the recorded program is NVOD program (col.10, lines 23-62, col.11, lines 8-64 and col.19, lines 1-15).

As to claim 9, Maissel further discloses updating audience information based on the number of times each audience member played back the recorded program (col.11, lines 8-64 and col.19, lines 1-49)

As to claims 10 and 11, Maissel further discloses receiving an indication for a user interactions where such action controls how the how the recorded program is played back, executing the user's interactions in response to receiving the request and updating audience information based on the user's interactions comprises actions such as record and play, watched programs, purchased programs, etc., (col.11, lines 8-64, col.16, lines 26-63, col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 13, Maissel further discloses where the ITV application is an ITV program guide (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 14, Maissel further discloses providing an interactive indicator that notifies the user when the audience information is available, where the interactive indicator comprises content selected from text, graphics, audio, video and animation (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 15, Maissel further discloses allowing the user to compare programs based on audience information distributed to the user for the programs (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 16, Maissel further discloses providing the audience information for a portion of the recorded program (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 17, Maissel further discloses where the portion is a scene within the recorded program (col.18, lines 35-67 and col.19, line 9-col.20, line 59)

As to claim 18, Maissel further discloses providing the audience information for genre of programs (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 19, Maissel further discloses providing the audience information for the recorded program based on a time slot (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 20, Maissel further discloses distributing audience information to a plurality of users and audience information for a subset of plurality of users to the user (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 21, Maissel further discloses where the subset of plurality of users is defined on user demographics (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claims 22-23, Maissel further teaches monitoring the users action on flip display or channel change and browsing display of surfing (col. 16, lines 26-36 and col. 17, lines 17-50).

As to claim 24, Maissel further discloses providing the audience information to the user in program listings display (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 25, Maissel further discloses updating the audience information based on a user profile of a user from which the indication was received related to the playback of the recorded program (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

As to claim 26-28, Maissel further discloses calculating audience size for the recorded program, based on weightings to playback information and accessing a table of grading information for assigning points to playback information (col.18, lines 35-67 and col.19, line 9-col.20, line 59).

Claim 30 is met as previously discussed with respect to claim 2.

Claim 31 is met as previously discussed with respect to claim 3.

Claim 32 is met as previously discussed with respect to claim 4.

Claim 33 is met as previously discussed with respect to claim 5.

Claim 34 is met as previously discussed with respect to claim 6.

Claim 35 is met as previously discussed with respect to claim 14.

Claim 36 is met as previously discussed with respect to claim 15.

Claim 37 is met as previously discussed with respect to claim 16.

Claim 38 is met as previously discussed with respect to claim 17.

Claim 39 is met as previously discussed with respect to claim 18.

Claim 40 is met as previously discussed with respect to claim 19.

Claim 41 is met as previously discussed with respect to claim 20.

Claim 42 is met as previously discussed with respect to claim 21.

Claims 43-44 are met as previously discussed with respect to claims 22-23.

Claim 45 is met as previously discussed with respect to claim 24.

Claim 46 is met as previously discussed with respect to claim 25.

Claim 50 is met as previously discussed with respect to claim 13.

Claim 51 is met as previously discussed with respect to claim 2.

Claim 52 is met as previously discussed with respect to claim 2.

Claim 53 is met as previously discussed with respect to claim 3.

Claim 54 is met as previously discussed with respect to claim 4.

Claim 55 is met as previously discussed with respect to claim 5.

Claim 56 is met as previously discussed with respect to claim 6.

Claim 60 is met as previously discussed with respect to claim 14.

Claim 62 is met as previously discussed with respect to claim 15.

Claim 63 is met as previously discussed with respect to claim 16.

Claim 64 is met as previously discussed with respect to claim 17.

Claim 65 is met as previously discussed with respect to claim 19.

Claim 66 is met as previously discussed with respect to claim 20.

Claim 67 is met as previously discussed with respect to claim 21.

Claims 68-69 are met as previously discussed with respect to claims 22-23.

Claim 70 is met as previously discussed with respect to claim 24.

Claim 71 is met as previously discussed with respect to claim 9.

Claim 72 is met as previously discussed with respect to claims 10-11.

Claim 73 is met as previously discussed with respect to claims 10-11.

Claim 74 is met as previously discussed with respect to claims 10-11.

Claim 75 is met as previously discussed with respect to claims 10-11.

Claim 76 is met as previously discussed with respect to claims 10-11.

Claims 77-79 are met as previously discussed with respect to claims 26-28.

As to claims 80, 108, 130, 159, 187 and 209, Maissel further discloses "a system: for measuring audience information based on playbacks of a recorded program, for providing audience information with program listings in an interactive television application, for measuring audience information for upcoming program in an interactive application..." as previously discussed with respect to the rejection of claim 1.

Claim 81 is met as previously discussed with respect to claim 2.

Claim 82 is met as previously discussed with respect to claim 3.

Claim 83 is met as previously discussed with respect to claim 4.

Claim 84 is met as previously discussed with respect to claim 5.

Claim 85 is met as previously discussed with respect to claim 6.

Claim 88 is met as previously discussed with respect to claim 9.

Claim 89 is met as previously discussed with respect to claim 10.

Claim 90 is met as previously discussed with respect to claim 11.

Claim 92 is met as previously discussed with respect to claim 13.

Claim 93 is met as previously discussed with respect to claim 14.

Claim 94 is met as previously discussed with respect to claim 15.

Claim 95 is met as previously discussed with respect to claim 16.

Claim 96 is met as previously discussed with respect to claim 17.

Claim 97 is met as previously discussed with respect to claim 18

Claim 98 is met as previously discussed with respect to claim 19.

Claim 99 is met as previously discussed with respect to claim 20.

Claim 100 is met as previously discussed with respect to claim 21.

Claims 101-102 are met as previously discussed with respect to claims 22-23.

Claim 103 is met as previously discussed with respect to claim 24.

Claim 104 is met as previously discussed with respect to claim 25.

Claims 105-107 are met as previously discussed with respect to claims 26-28.

Claim 109 is met as previously discussed with respect to claim 2.

Claim 110 is met as previously discussed with respect to claim 3.

Claim 111 is met as previously discussed with respect to claim 4.

Claim 112 is met as previously discussed with respect to claim 5.

Claim 113 is met as previously discussed with respect to claim 6.

Claim 114 is met as previously discussed with respect to claim 14.

Claim 115 is met as previously discussed with respect to claim 15.

Claim 116 is met as previously discussed with respect to claim 16.

Claim 117 is met as previously discussed with respect to claim 17.

Claim 118 is met as previously discussed with respect to claim 18.

Claim 119 is met as previously discussed with respect to claim 19.

Claim 120 is met as previously discussed with respect to claim 20.

Claim 121 is met as previously discussed with respect to claim 21.

Claim 124 is met as previously discussed with respect to claim 24.

Claim 125 is met as previously discussed with respect to claim 25.

Claim 129 is met as previously discussed with respect to claims 13.

Claim 131 is met as previously discussed with respect to claim 2.

Claim 132 is met as previously discussed with respect to claim 3.

Claim 133 is met as previously discussed with respect to claim 4.

Claim 134 is met as previously discussed with respect to claim 5.

Claim 135 is met as previously discussed with respect to claim 6.

Claim 139 is met as previously discussed with respect to claim 14.

Claim 140 is met as previously discussed with respect to claim 15.

Claim 141 is met as previously discussed with respect to claim 16.

Claim 142 is met as previously discussed with respect to claim 17.

Claim 143 is met as previously discussed with respect to claim 18.

Claim 144 is met as previously discussed with respect to claim 19.

Claim 145 is met as previously discussed with respect to claim 20.

Claim 146 is met as previously discussed with respect to claim 21.

Claims 147-148 are met as previously discussed with respect to claims 22-23.

Claim 149 is met as previously discussed with respect to claim 24.

Claim 150 is met as previously discussed with respect to claims 10-11.

Claim 151 is met as previously discussed with respect to claims 10-11.

Claim 152 is met as previously discussed with respect to claims 10-11.

Claim 153 is met as previously discussed with respect to claims 10-11.

Claim 154 is met as previously discussed with respect to claims 10-11.

Claim 155 is met as previously discussed with respect to claim 25.

Claims 156-158 are met as previously discussed with respect to claims 26-28.

Claim 160 is met as previously discussed with respect to claim 2.

Claim 161 is met as previously discussed with respect to claim 3.

Claim 162 is met as previously discussed with respect to claim 4.

Claim 163 is met as previously discussed with respect to claim 5.

Claim 164 is met as previously discussed with respect to claim 6.

Claim 167 is met as previously discussed with respect to claim 9.

Claim 168 is met as previously discussed with respect to claim 10.

Claim 169 is met as previously discussed with respect to claim 11.

Claim 171 is met as previously discussed with respect to claim 13.

Claim 172 is met as previously discussed with respect to claim 14.

Claim 173 is met as previously discussed with respect to claim 15.

Claim 174 is met as previously discussed with respect to claim 16.

Claim 175 is met as previously discussed with respect to claim 17.

Claim 176 is met as previously discussed with respect to claim 18

Claim 177 is met as previously discussed with respect to claim 19.

Claim 178 is met as previously discussed with respect to claim 20.

Claim 179 is met as previously discussed with respect to claim 21.

Claims 180-181 are met as previously discussed with respect to claims 22-23.

Claim 182 is met as previously discussed with respect to claim 24.

Claim 183 is met as previously discussed with respect to claim 25.

Claims 184-186 are met as previously discussed with respect to claims 26-28.

Claim 188 is met as previously discussed with respect to claim 2.

Claim 189 is met as previously discussed with respect to claim 3.

Claim 190 is met as previously discussed with respect to claim 4.

Claim 191 is met as previously discussed with respect to claim 5.

Claim 192 is met as previously discussed with respect to claim 6.

Claim 193 is met as previously discussed with respect to claim 14.

Claim 194 is met as previously discussed with respect to claim 15.

Claim 195 is met as previously discussed with respect to claim 16.

Claim 196 is met as previously discussed with respect to claim 17.

Claim 197 is met as previously discussed with respect to claim 18.

Claim 198 is met as previously discussed with respect to claim 19.

Claim 199 is met as previously discussed with respect to claim 20.

Claim 200 is met as previously discussed with respect to claim 21.

Claims 201-202 are met as previously discussed with respect to claims 22-23.

Claim 203 is met as previously discussed with respect to claim 24.

Claim 204 is met as previously discussed with respect to claim 25.

Claim 208 is met as previously discussed with respect to claims 13.

Claim 210 is met as previously discussed with respect to claim 2.

Claim 211 is met as previously discussed with respect to claim 3.

Claim 212 is met as previously discussed with respect to claim 4.

Claim 213 is met as previously discussed with respect to claim 5.

Claim 214 is met as previously discussed with respect to claim 6

Claim 218 is met as previously discussed with respect to claim 14.

Claim 219 is met as previously discussed with respect to claim 15.

Claim 220 is met as previously discussed with respect to claim 16.

Claim 221 is met as previously discussed with respect to claim 17.

Claim 222 is met as previously discussed with respect to claim 18.

Claim 223 is met as previously discussed with respect to claim 19.

Claim 224 is met as previously discussed with respect to claim 20.

Claim 225 is met as previously discussed with respect to claim 21.

Claims 226-227 are met as previously discussed with respect to claims 22-23.

Claim 228 is met as previously discussed with respect to claim 24.

Claim 229 is met as previously discussed with respect to claims 10-11.

Claim 230 is met as previously discussed with respect to claims 10-11.

Claim 231 is met as previously discussed with respect to claims 10-11.

Claim 232 is met as previously discussed with respect to claims 10-11.

Claim 233 is met as previously discussed with respect to claims 10-11.

Claim 234 is met as previously discussed with respect to claim 25.

Claims 235-237 are met as previously discussed with respect to claims 26-28.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8, 58, 87, 137, 166 and 216 rejected under 35 U.S.C. 103(a) as being unpatentable over **Maissel et al (6,637,029)** as applied to claims 1, 51, 80, 130, 159 and 209 above and in view of **Hendricks et al (6,539,548).**

As to claims 8, 58, 87, 137, 166 and 216, Maissel fails to explicitly teach updating market share of the recorded programs.

However, note **Hendricks** teaches analyzing rating for television shows to determine the appropriate schedule or program lineup to gain market share and revenue from advertising.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of Hendricks into the system Maissel to provide interesting programs to users, to gain a higher market share than other competitors.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Annan Q. Shang** whose telephone number is **571-272-7355**. The examiner can normally be reached on **700am-400pm**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Christopher S. Kelley** can be reached on **571-272-7331**. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the **Electronic Business Center (EBC) at 866-217-9197 (toll-free)**. If you would like assistance from a **USPTO Customer Service Representative** or access to the automated information system, call **800-786-9199 (IN USA OR CANADA) or 571-272-1000**.

Annan Q. Shang

COPY OF MAISSEL ET AL. U.S. PATENT NO. 6,637,029

US006637029B1

(12) **United States Patent**
Maissel et al.

(10) **Patent No.: US 6,637,029 B1**
(45) **Date of Patent: Oct. 21, 2003**

(54) **INTELLIGENT ELECTRONIC PROGRAM GUIDE**

(75) Inventors: **Jonathan Maissel**, Jerusalem (IL); **Amir Eilat**, Tel Aviv (IL); **Yossef Tsuria**, Shoham (IL); **Moshe Kranc**, Jerusalem (IL), **Yishai Sered**, Jerusalem (IL); **Gershon Bar-On**, Mizrah Binyamin (IL); **Shabtai Adlow**, Efrat (IL); **David Zvi**el, Efrat (IL)

(73) Assignee: **NDS Limited**, Staines (GB)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/242,871**

(22) PCT Filed: **Jun. 30, 1998**

(86) PCT No.: **PCT/IL98/00307**

§ 371 (c)(1),
(2), (4) Date: **Jun. 10, 1999**

(87) PCT Pub. No.: **WO99/01984**

PCT Pub. Date: **Jan. 14, 1999**

(30) **Foreign Application Priority Data**

Jul. 3, 1997 (IL) 121230

(51) **Int. Cl.**[7] **H04N 5/445**; G06F 3/00; G06F 13/00; G09G 5/00

(52) **U.S. Cl.** **725/46**; 725/39; 725/43; 345/854; 345/804

(58) **Field of Search** 725/32–34, 37–40, 725/43–46; 386/125; 345/721, 804, 853–854; 358/86

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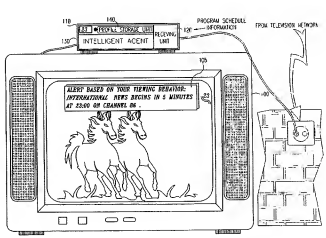
Assistant Examiner—Hai V. Tran
(74) *Attorney, Agent, or Firm*—Welsh & Katz, Ltd.

(57) **ABSTRACT**

A subscriber unit for use in a television system including a television network and transmitting apparatus for transmitting program schedule information, the subscriber unit including a receiving unit for receiving the program schedule information, a profile storage unit for storing at least one viewer preference profile of at least one television viewer, an intelligent agent for customizing the program schedule information based, at least in part, on the viewer preference profile, to produce a program guide including customized program schedule information, and display apparatus for displaying the program guide.

20 Claims, 21 Drawing Sheets



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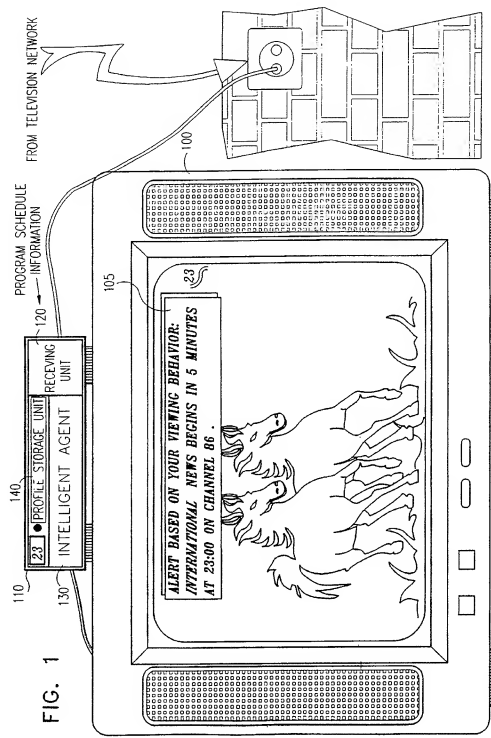

FROM TELEVISION NETWORK
PROGRAM SCHEDULE INFORMATION
120
RECEIVING UNIT
PROFILE STORAGE UNIT
23
INTELLIGENT AGENT
130
140
110
100
105
23
ALERT BASED ON YOUR VIEWING BEHAVIOR:
INTERNATIONAL NEWS BEGINS IN 5 MINUTES
AT 23:00 ON CHANNEL 86 .

FIG. 1

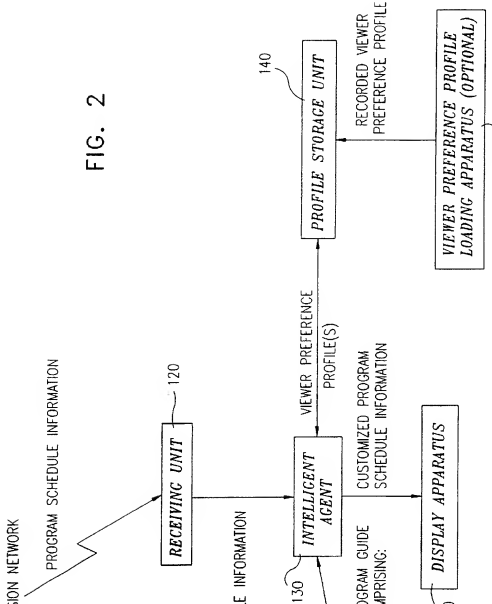

FROM TELEVISION NETWORK
PROGRAM SCHEDULE INFORMATION
RECEIVING UNIT
120
PROGRAM SCHEDULE INFORMATION
INTELLIGENT AGENT
130
TELEVISION VIEWING INFORMATION
PROGRAM GUIDE COMPRISING:
CUSTOMIZED PROGRAM SCHEDULE INFORMATION
DISPLAY APPARATUS
150
VIEWER PREFERENCE PROFILE(S)
PROFILE STORAGE UNIT
140
RECORDED VIEWER PREFERENCE PROFILE
VIEWER PREFERENCE PROFILE LOADING APPARATUS (OPTIONAL)
160

FIG. 2

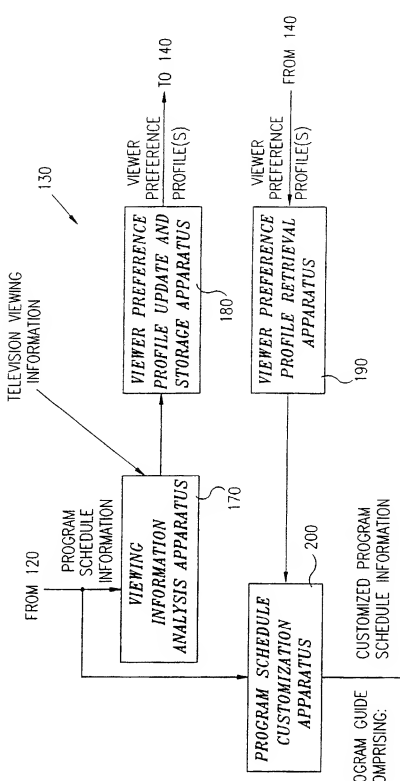
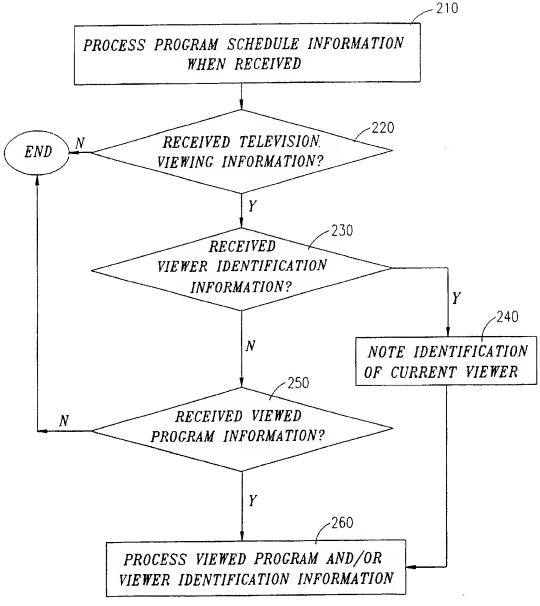

130
TELEVISION VIEWING INFORMATION
FROM 120
PROGRAM SCHEDULE INFORMATION
VIEWING INFORMATION ANALYSIS APPARATUS
170
VIEWER PREFERENCE PROFILE UPDATE AND STORAGE APPARATUS
180
VIEWER PREFERENCE PROFILE(S)
TO 140
VIEWER PREFERENCE PROFILE RETRIEVAL APPARATUS
190
VIEWER PREFERENCE PROFILE(S)
FROM 140
PROGRAM SCHEDULE CUSTOMIZATION APPARATUS
200
CUSTOMIZED PROGRAM SCHEDULE INFORMATION
PROGRAM GUIDE COMPRISING:

FIG. 3

FIG. 4


210
PROCESS PROGRAM SCHEDULE INFORMATION WHEN RECEIVED
220
RECEIVED TELEVISION VIEWING INFORMATION?
END
N
Y
230
RECEIVED VIEWER IDENTIFICATION INFORMATION?
Y
240
NOTE IDENTIFICATION OF CURRENT VIEWER
N
250
RECEIVED VIEWED PROGRAM INFORMATION?
N
Y
260
PROCESS VIEWED PROGRAM AND/OR VIEWER IDENTIFICATION INFORMATION

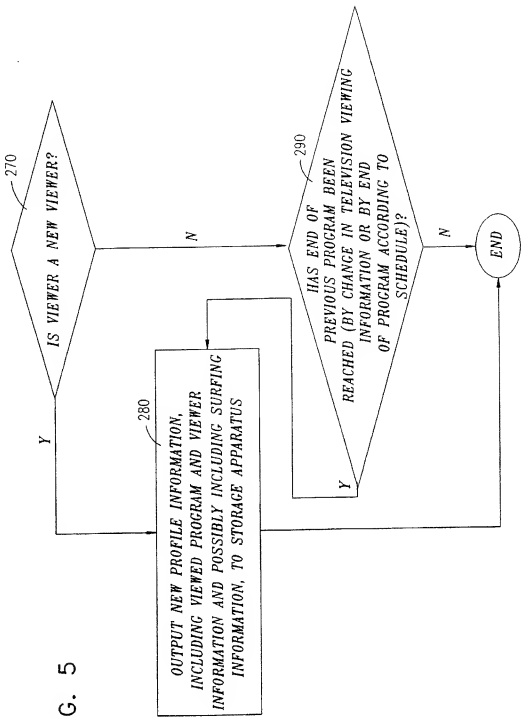

270
IS VIEWER A NEW VIEWER?
Y
N
280
OUTPUT NEW PROFILE INFORMATION, INCLUDING VIEWED PROGRAM AND VIEWER INFORMATION AND POSSIBLY INCLUDING SURFING INFORMATION, TO STORAGE APPARATUS
290
HAS END OF PREVIOUS PROGRAM BEEN REACHED (BY CHANGE IN TELEVISION VIEWING INFORMATION OR BY END OF PROGRAM ACCORDING TO SCHEDULE)?
Y
N
END

FIG. 5

FIG. 6

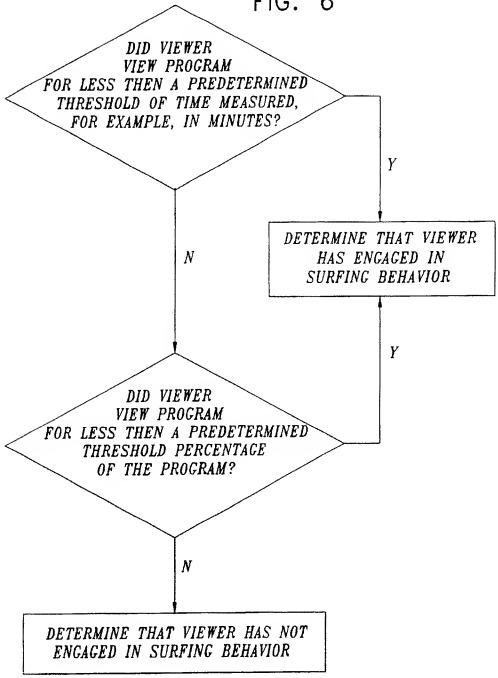
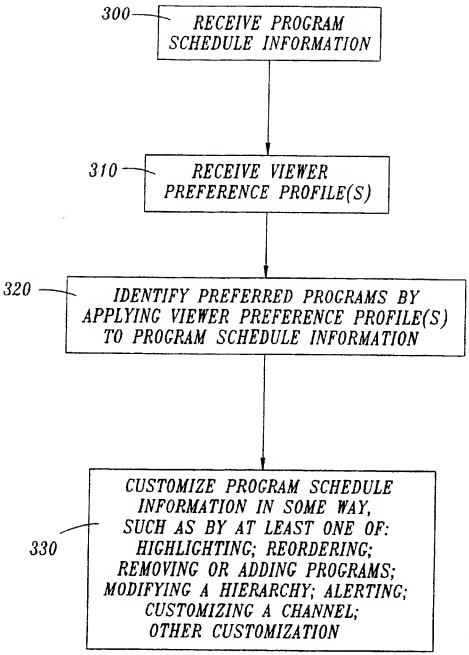

DID VIEWER VIEW PROGRAM FOR LESS THEN A PREDETERMINED THRESHOLD OF TIME MEASURED, FOR EXAMPLE, IN MINUTES?
Y
N
DETERMINE THAT VIEWER HAS ENGAGED IN SURFING BEHAVIOR
Y
DID VIEWER VIEW PROGRAM FOR LESS THEN A PREDETERMINED THRESHOLD PERCENTAGE OF THE PROGRAM?
N
DETERMINE THAT VIEWER HAS NOT ENGAGED IN SURFING BEHAVIOR

FIG. 7


300
RECEIVE PROGRAM SCHEDULE INFORMATION
310
RECEIVE VIEWER PREFERENCE PROFILE(S)
320
IDENTIFY PREFERRED PROGRAMS BY APPLYING VIEWER PREFERENCE PROFILE(S) TO PROGRAM SCHEDULE INFORMATION
330
CUSTOMIZE PROGRAM SCHEDULE INFORMATION IN SOME WAY, SUCH AS BY AT LEAST ONE OF: HIGHLIGHTING; REORDERING; REMOVING OR ADDING PROGRAMS; MODIFYING A HIERARCHY; ALERTING; CUSTOMIZING A CHANNEL; OTHER CUSTOMIZATION

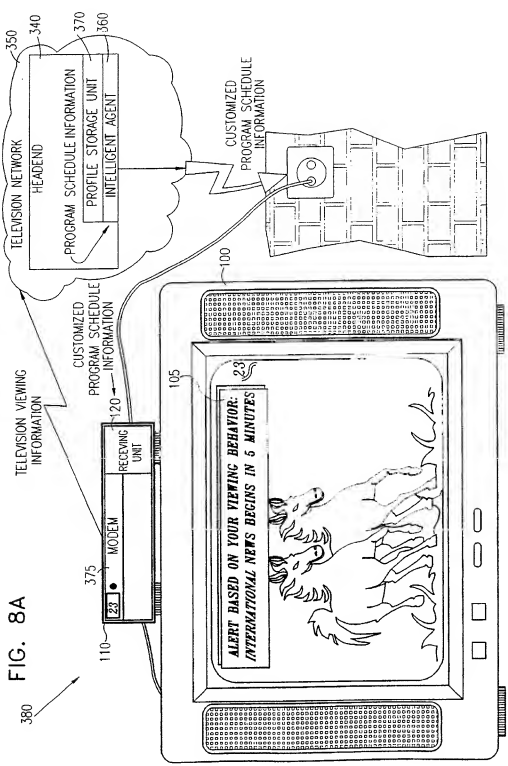

380
350
340
370
360
TELEVISION NETWORK
HEADEND
PROGRAM SCHEDULE INFORMATION
PROFILE STORAGE UNIT
INTELLIGENT AGENT
CUSTOMIZED PROGRAM SCHEDULE INFORMATION
TELEVISION VIEWING INFORMATION
CUSTOMIZED PROGRAM SCHEDULE INFORMATION
100
105
120
MODEM
RECEIVING UNIT
375
110
ALERT BASED ON YOUR VIEWING BEHAVIOR: INTERNATIONAL NEWS BEGINS IN 5 MINUTES

FIG. 8A

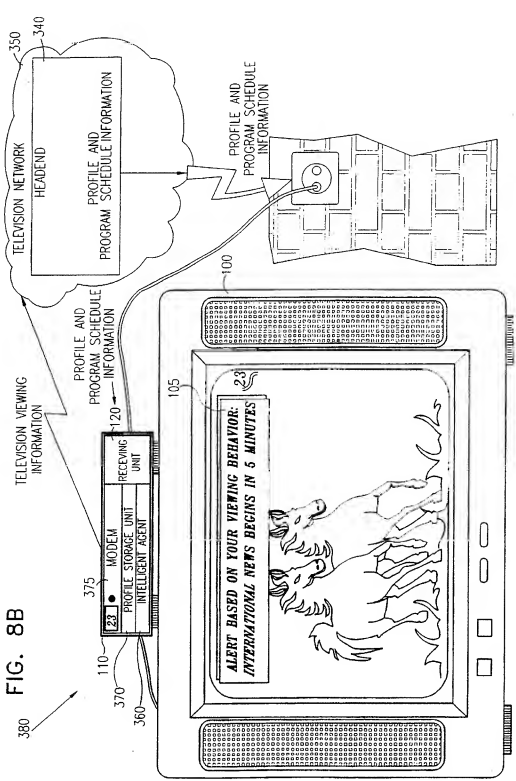

380
110
370
360
375
MODEM
PROFILE STORAGE UNIT
INTELLIGENT AGENT
RECEIVING UNIT
120
105
100
TELEVISION VIEWING INFORMATION
PROFILE AND PROGRAM SCHEDULE INFORMATION
TELEVISION NETWORK
350
340
HEADEND
PROFILE AND PROGRAM SCHEDULE INFORMATION
PROFILE AND PROGRAM SCHEDULE INFORMATION
ALERT BASED ON YOUR VIEWING BEHAVIOR:
INTERNATIONAL NEWS BEGINS IN 5 MINUTES!
23

FIG. 8B

FIG. 9A

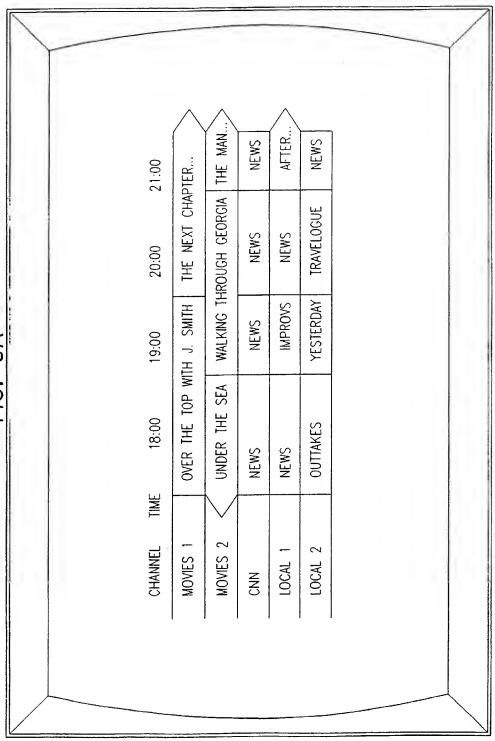

CHANNEL
TIME
18:00
19:00
20:00
21:00
MOVIES 1
OVER THE TOP WITH J. SMITH
THE NEXT CHAPTER...
MOVIES 2
UNDER THE SEA
WALKING THROUGH GEORGIA
THE MAN...
CNN
NEWS
NEWS
NEWS
NEWS
LOCAL 1
NEWS
IMPROVS
NEWS
AFTER...
LOCAL 2
OUTTAKES
YESTERDAY
TRAVELOGUE
NEWS

FIG. 9B

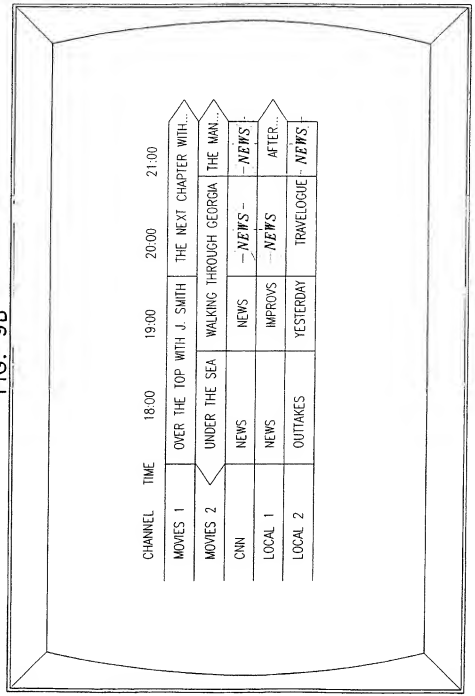
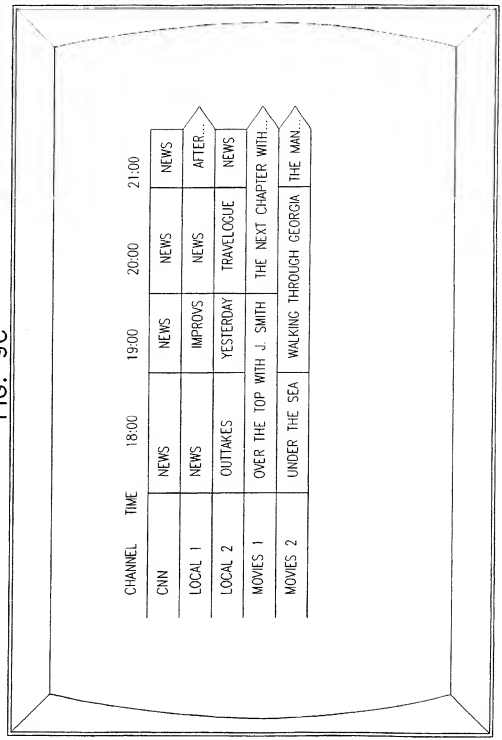

CHANNEL
TIME
18:00
19:00
20:00
21:00
MOVIES 1
OVER THE TOP WITH J. SMITH
THE NEXT CHAPTER WITH...
MOVIES 2
UNDER THE SEA
WALKING THROUGH GEORGIA
THE MAN...
CNN
NEWS
NEWS
-NEWS-
-NEWS-
LOCAL 1
NEWS
IMPROVS
-NEWS-
AFTER...
LOCAL 2
OUTTAKES
YESTERDAY
TRAVELOGUE
-NEWS-

FIG. 9C


CHANNEL
TIME
18:00
19:00
20:00
21:00
CNN
NEWS
NEWS
NEWS
NEWS
LOCAL 1
NEWS
IMPROVS
NEWS
AFTER...
LOCAL 2
OUTTAKES
YESTERDAY
TRAVELOGUE
NEWS
MOVIES 1
OVER THE TOP WITH J. SMITH
THE NEXT CHAPTER WITH...
MOVIES 2
UNDER THE SEA
WALKING THROUGH GEORGIA
THE MAN...

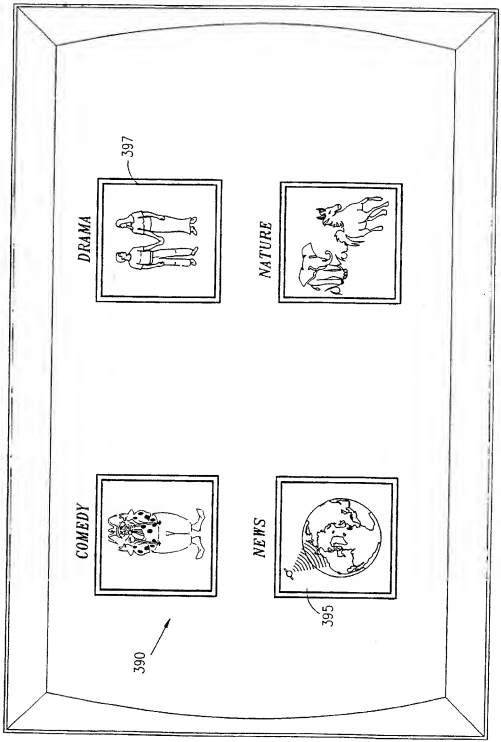


FIG. 9D

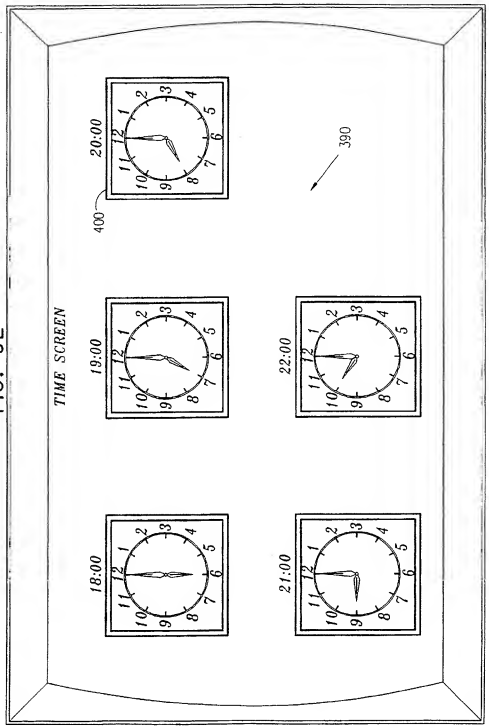


FIG. 9E

FIG. 9F

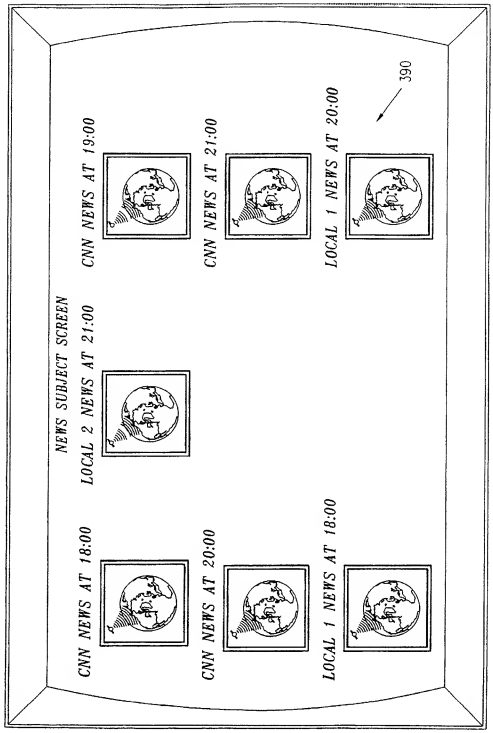

NEWS SUBJECT SCREEN
CNN NEWS AT 18:00
LOCAL 2 NEWS AT 21:00
CNN NEWS AT 19:00
CNN NEWS AT 20:00
CNN NEWS AT 21:00
LOCAL 1 NEWS AT 18:00
LOCAL 1 NEWS AT 20:00
390

FIG. 9G

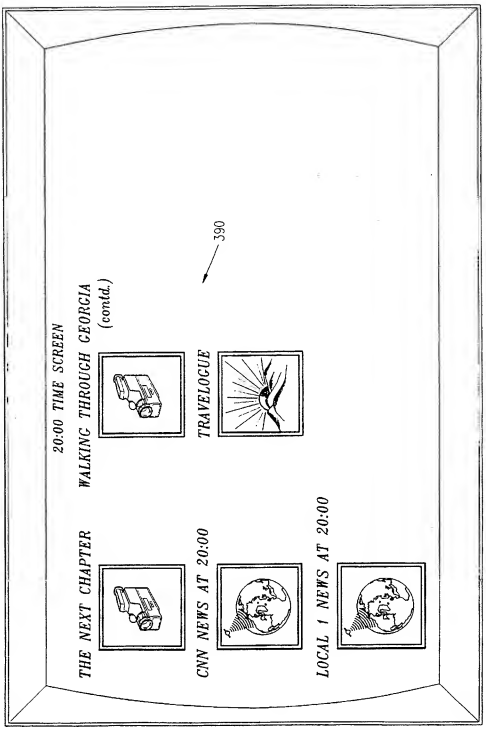
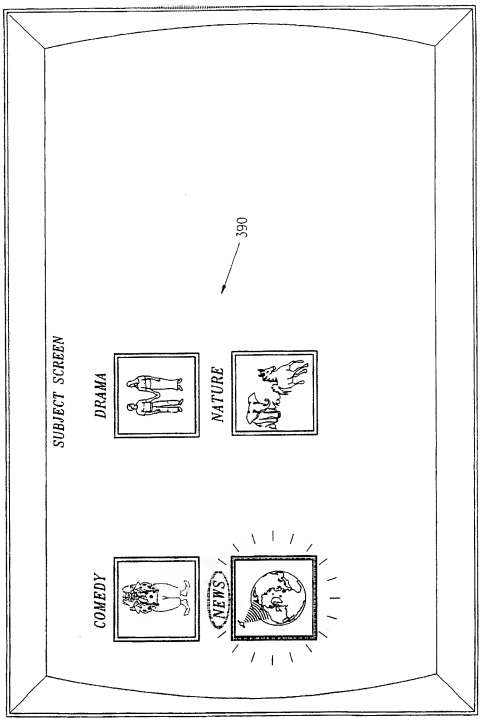

20:00 TIME SCREEN
THE NEXT CHAPTER
WALKING THROUGH GEORGIA (contd.)
CNN NEWS AT 20:00
TRAVELOGUE
390
LOCAL 1 NEWS AT 20:00

FIG. 9H



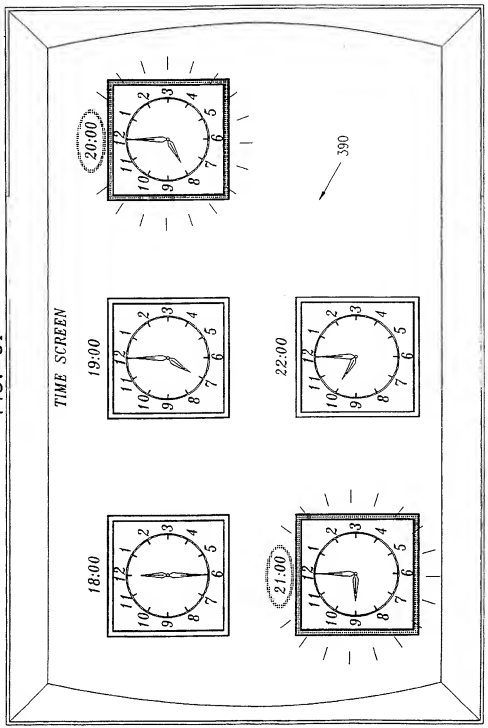


FIG. 91

FIG. 9J

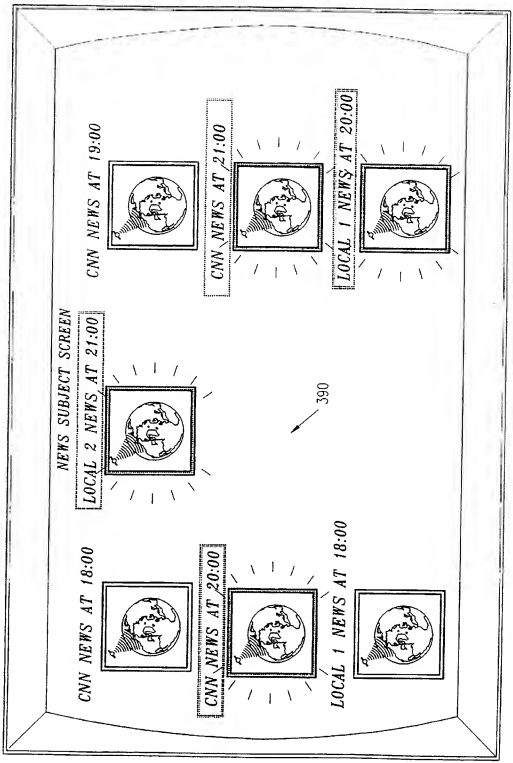

NEWS SUBJECT SCREEN
CNN NEWS AT 18:00
LOCAL 2 NEWS AT 21:00
CNN NEWS AT 19:00
CNN NEWS AT 20:00
CNN NEWS AT 21:00
LOCAL 1 NEWS AT 18:00
LOCAL 1 NEWS AT 20:00
390

FIG. 9K

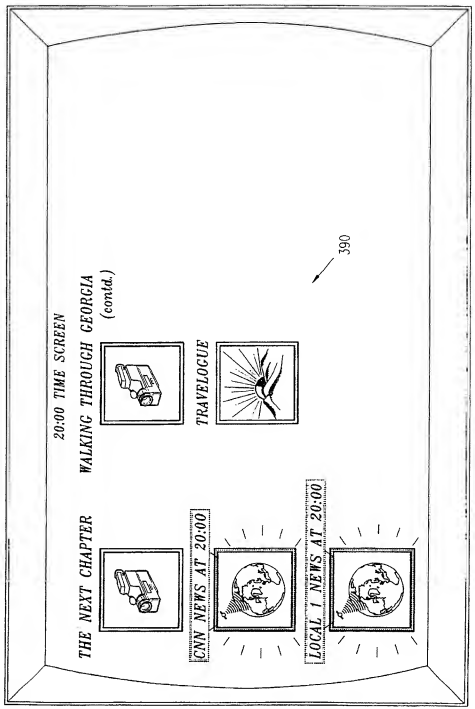
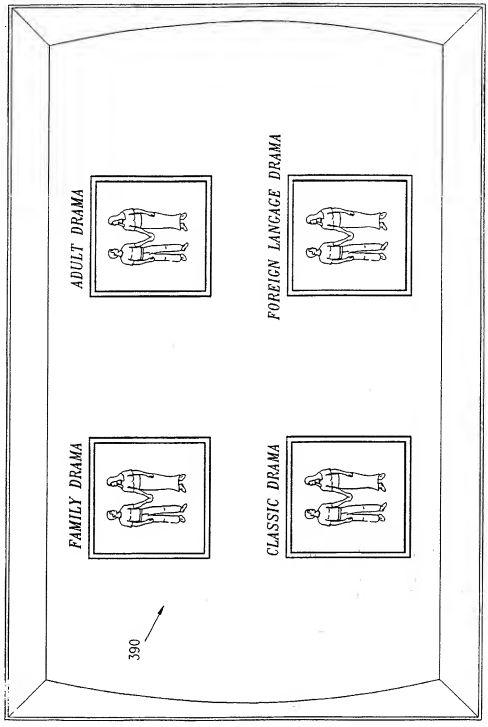

20:00 TIME SCREEN
THE NEXT CHAPTER
WALKING THROUGH GEORGIA (contd.)
CNN NEWS AT 20:00
TRAVELOGUE
LOCAL 7 NEWS AT 20:00
390

FIG. 9L


ADULT DRAMA
FOREIGN LANGAGE DRAMA
FAMILY DRAMA
CLASSIC DRAMA
390

INTELLIGENT ELECTRONIC PROGRAM GUIDE

The present application is a 371 submission of PCT/IL98/00307, filed on Jun. 30, 1998 and entitled Intelligent Electronic Program Guide, which was published on Jan. 14, 1999 with International Publication No. WO 99/01984.

FIELD OF THE INVENTION

The present invention relates to television systems in general, and in particular to electronic program guides for television systems.

BACKGROUND OF THE INVENTION

Electronic program guides are well-known in tbe art. Electronic program guides provide television program schedule information on tbe television screen. Typically, electronic program guides display a rectangular grid schedule on the television screen, and allow the viewer to navigate through the schedule and to perform a variety of functions for one or more programs appearing on the schedule. Typical prior art program guides and related technologies are described in the following patents and published applications:

U.S. Pat. No. 4,706,121 to Young and Reexamination Certificate B1 4,706,121 to Young;

U.S. Pat. No. 4,977,455 to Young;

U.S. Pat. No. 5,038,211 to Hallenbeck;

U.S. Pat. No. 5,151,789 to Young;

U.S. Pat. No. 5,323,240 to Amano et al.;

U.S. Pat. No. 5,353,121 to Young et al.;

U.S. Pat. No. 5,444,499 to Saitob

U.S. Pat. No. 5,479,266 to Young et al.;

U.S. Pat. No. 5,479,268 to Young et al.;

U.S. Pat. No. 5,515,106 to Chancy et al.;

U.S. Pat. No. 5,524,195 to Clanton, III et al.;

U.S. Pat. No. 5,550,576 to Klosterman;

U.S. Pat. No. 5,564,088 to Saitoh;

PCT published application WO 90/00847, assigned to Insight Telecast, Inc.;

PCT published application WO 91/07050, assigned to Insight Telecast, Inc.;

PCT published application 92/04801, assigned to Insight Telecast, Inc.; and

PCT published application WO 95/31069, assigned to Starsight Telecast, Inc.

Customization of program guide information based on information explicitly entered by a viewer is known in the art and is described, for example, in U.S. Pat. No. 5,479,266 and 5,479,268, mentioned above Customization of program guide information based on the channel watcbed and time watched is described in the following U.S. Pat. Nos. 5,323,240; 5,444,499; and 5,564,088.

Broadcast methods of interest in the field of the present invention are described in DVB standard ETS 300-468.

The terms "agent" and "intelligent agent" are used interchangeably throughout the present specification and claims to refer to any machine-based assistant, including but not limited to a machine-based assistant implemented in software, with authority delegated from the user or users of the agent. Specifically, the terms "agent" and "intelligent agent", as used herein, are not limited to agents used by a particular person and may include agents used by one person or a plurality of people, whether used in a domestic, commercial, or other context.

Intelligent agents are both in use and proposed for future use in computer systems, particularly computer systems connected to an internetwork such as the Internet. Publications describing the intelligent agent prior art and proposals for the future use of intelligent agents include the following:

1. Fah-Chun Cbeong, *Internet Agents: Spiders, Wanderers, Brokers, and 'Bots*, published by New Riders Publishing, 1996, describes the state of the art in agents in general and in Internet agents in particular. Chapter 1, pages 3-35 and the bibliography thereto on pages 387-390 are particularly relevant to the agent prior art. On page 9, Cheong describes surrogate bots, which are agents to "relieve users of low-level administrative and clerical tasks, such as setting up meetings, sending out papers, locating information, tracking whereabouts of people, and so on." Cheong gives the example of a visitor scheduling bot whose purpose is to assist in scheduling tbe visitors of the user of the bot.

On page 19, Cheong describes learning agents, a type of personal agent envisioned in the future for which "learning about the particular user's habits and goals, and tailoring to them accordingly" is the essential principle of operation. As an example of a learning agent, Cheong gives a calendar apprentice which helps a user organize the user's meeting schedule.

2. A World Wide Web Document found on the Internet at www.raleigh.ibm.com/iag/iaghome.html describes intelligent agents in general and IBM intelligent agents in particular. A copy of the document was obtained from the Internet on Sept. 24, 1996 at 2:14 PM.

3. A World Wide Web Document found on the Internet at www.raleigh.ibm.comiiag/iagpic2.html, entitled "Tbe Role of Intelligent Agents in the Information Infrastructure", describes various application areas that intelligent agents can enhance. In section 3.8, Adaptive User Interfaces, mention is made that "agent technology allows systems to monitor the user's actions, develop models of user abilities, and automatically help out when problems arise." The document neitber describes nor suggests the use of intelligent agents to customize an electronic program guide or any similar system component. A copy of the document was obtained from the Internet on Sep. 24, 1996 at 2:16 PM.

The above-mentioned prior art does not appear to describe or suggest the use of intelligent agents in any of the following contexts: in television systems; with a program guide in any context; or witb an entity similar to a program guide in a computer system.

The disclosures of all references mentioned above and throughout the present specification are hereby incorporated herein by reference.

SUMMARY OF THE INVENTION

The present invention seeks to provide an improved electronic program guide for use in a television system. Throughout the present specification and claims, the term "television system" is used in a broad sense to include all types of television systems, including but not limited to any one or combination of the following: one-way systems; two-way systems; Systems utilizing cable communication networks, satellite communication networks, telephone communication networks, other communication networks, or any combination tbereof, and CATV systems. Particularly, both pay television systems and non-pay or free television systems are included in the term "television system".

The present invention provides for customization of an electronic program guide by an intelligent agent. Typically, the intelligent agent monitors viewing behavior of one viewer or a plurality of viewers and creates a preference profile based on the monitored viewing behavior. The intelligent agent then preferably employs the preference profile to customize the electronic program guide based on the preference profile.

There is thus provided in accordance with a preferred embodiment of the present invention a television system including a television network, and transmitting apparatus for transmitting program schedule information to a multiplicity of subscriber units, at least one of the multiplicity of subscriber units including a receiving unit for receiving the program schedule information from the television network, a profile storage unit for storing at least one viewer preference profile of at least one television viewer, an intelligent agent for customizing the program schedule information based, at least in part, on the viewer preference profile, to produce a program guide including customized program schedule information, and display apparatus for displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a subscriber unit for use in a television system including a television network and transmitting apparatus for transmitting program schedule information, the subscriber unit including a receiving unit for receiving the program schedule information, a profile storage unit for storing at least one viewer preference profile of at least one television viewer, an intelligent agent for customizing the program schedule information based, at least in part, on the viewer preference profile, to produce a program guide including customized program schedule information, and display apparatus for displaying the program guide.

There is also provided in accordance with another preferred embodiment transmitting apparatus for transmitting program schedule information to a multiplicity of subscriber units, the transmitting apparatus including a headend, the headend including a profile storage unit for storing at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, and an intelligent agent for customizing the program schedule information based, at least in part, on the viewer preference profile, to produce customized program schedule information, wherein the transmitting apparatus is operative to transmit the customized program schedule information to the one of the multiplicity of subscriber units, and at least one of the multiplicity of subscriber units includes a receiving unit for receiving the customized program schedule information from the television network, and display apparatus for displaying a program guide including the customized program schedule information.

There is also provided in accordance with another preferred embodiment of the present invention a headend for use in a television system including a television network and transmitting apparatus for transmitting customized program schedule information to at least one subscriber unit, the headend including a profile storage unit for storing at least one viewer preference profile of at least one television viewer associated with the at least one subscriber unit, and an intelligent agent for customizing the program schedule information based, at least in part, on the viewer preference profile, to produce customized program schedule information.

Further in accordance with a preferred embodiment of the present invention the transmitting apparatus includes network transmitting apparatus for transmitting over the television network.

Still further in accordance with a preferred embodiment of the present invention the transmitting apparatus includes recording apparatus for recording information on a removable medium, and means for sending the removable medium to a subscriber location including the subscriber unit, and the subscriber unit includes loading apparatus for loading the information from the removable medium into the subscriber unit.

Additionally in accordance with a preferred embodiment of the present invention the intelligent agent also includes profile determination apparatus for determining viewer preference profile information for at least one television viewer and for providing the viewer preference profile information to the profile storage unit for storage as a viewer preference profile, and the profile determination apparatus determines the viewer preference profile information by monitoring television viewing behavior of the at least one television viewer.

Moreover in accordance with a preferred embodiment of the present invention the television viewing behavior includes viewing at least a portion of at least one viewed television program.

Further in accordance with a preferred embodiment of the present invention the television viewing behavior includes the television viewer viewing only a portion of at least one viewed television program.

Still further in accordance with a preferred embodiment of the present invention the profile determination apparatus compares a length of the portion of the at least one viewed television program to a predetermined viewing threshold length to determine whether the length is greater than the threshold length, and the profile determination apparatus determines the viewer preference profile information based, at least in part, on whether the length is greater than the threshold length.

Additionally in accordance with a preferred embodiment of the present invention when the length is determined to be less than the threshold length, the profile determination apparatus determines the viewer preference profile information without regard to the viewing only a portion of the at least one television program.

Moreover in accordance with a preferred embodiment of the present invention when the portion is determined to be less than the threshold, the profile determination apparatus determines that the viewer is engaged in channel surfing behavior, and the profile determination apparatus determines the viewer preference profile information based, at least in part, on the channel surfing behavior.

Further in accordance with a preferred embodiment of the present invention the program schedule information includes a first plurality of criteria, at least one of the first plurality of criteria being associated with each of a second plurality of television programs, and the profile determination apparatus determines the viewer preference profile information based, at least in part, on at least one of the plurality of criteria associated with the at least one viewed television program.

Still further in accordance with a preferred embodiment of the present invention the profile determination apparatus determines the viewer preference profile information, at least in part, in accordance with input provided by the at least one television viewer.

Additionally in accordance with a preferred embodiment of the present invention the profile determination apparatus

determines viewer preference profile information from a reaction of the at least one television viewer to previously displayed customized program schedule information.

Moreover in accordance with a preferred embodiment of the present invention each the viewer preference profile includes a viewer preference profile of exactly one viewer.

Further in accordance with a preferred embodiment of the present invention at least one the viewer preference profile includes a viewer preference profile of a plurality of viewers.

Still further in accordance with a preferred embodiment of the present invention the apparatus also includes viewer preference profile loading apparatus for providing a recorded viewer preference profile to the profile storage unit for storage.

Additionally in accordance with a preferred embodiment of the present invention the viewer preference profile loading apparatus receives the recorded viewer preference profile via the television network.

Moreover in accordance with a preferred embodiment of the present invention the viewer preference profile loading apparatus receives the viewer preference profile from profile storage apparatus located remotely thereto.

Further in accordance with a preferred embodiment of the present invention the customizing includes emphasizing at least a portion of the customized program schedule information based, at least in part, on the viewer preference profile.

Still further in accordance with a preferred embodiment of the present invention the customizing includes deemphasizing at least a portion of the customized program schedule information based, at least in part, on the viewer preference profile.

Additionally in accordance with a preferred embodiment of the present invention the customizing includes tailoring a custom channel based, at least in part, on the viewer preference profile.

Moreover in accordance with a preferred embodiment of the present invention the customizing includes automatically tuning to a program selected based, at least in part, on the viewer preference profile.

Further in accordance with a preferred embodiment of the present invention the customizing includes automatically recording, on recording apparatus, a program selected based, at least in part, on the viewer preference profile.

Still further in accordance with a preferred embodiment of the present invention the customizing includes ordering at least some of the customized program schedule information based, at least in part, on the viewer preference profile.

Additionally in accordance with a preferred embodiment of the present invention the display apparatus is operative to display an on-screen alert including at least part of the customized program schedule information.

Moreover in accordance with a preferred embodiment of the present invention the alert includes an unsolicited alert.

Further in accordance with a preferred embodiment of the present invention the unsolicited alert includes audience viewing information including an indication of a proportion of an audience currently viewing a program.

Still further in accordance with a preferred embodiment of the present invention the program includes a program currently being viewed by a viewer.

Additionally in accordance with a preferred embodiment of the present invention the program includes a program not currently being viewed by a viewer.

Further in accordance with a preferred embodiment of the present invention the display apparatus displays the on-screen alert a predetermined period of time before a scheduled starting time of a television program, the at least part of the customized program schedule information including information associated with the television program.

Still further in accordance with a preferred embodiment of the present invention the customizing includes displaying an indication of a proportion of an audience currently viewing a program.

Additionally in accordance with a preferred embodiment of the present invention the proportion of an audience includes a proportion of an audience viewing a program currently being viewed by a viewer.

Further in accordance with a preferred embodiment of the present invention the proportion of an audience includes a proportion of an audience viewing a program not currently being viewed by a viewer.

Still further in accordance with a preferred embodiment of the present invention the display apparatus includes an icon-based guide generator for producing an icon-based hierarchical program guide including the program schedule information, and the program guide includes the icon-based hierarchical program guide. The term "icon", as used throughout the present specification and claims, is used in the sense commonly accepted in the art of computer programming, particularly computer interface design, to refer to a small picture, photograph, or other representation which is meant to pictorially recall to the user a function or functions associated therewith.

There is also provided in accordance with another preferred embodiment of the present invention a television system including a television network, and transmitting apparatus for transmitting program schedule information to a multiplicity of subscriber units, each subscriber unit including a receiving unit for receiving the program schedule information from the television network, an icon-based guide generator for producing a program guide including an icon-based hierarchical program guide including the program schedule information, and display apparatus for displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a subscriber unit for use in a television system including a television network and transmitting apparatus for transmitting program schedule information, the subscriber unit including a receiving unit for receiving the program schedule information from the television network, an icon-based guide generator for producing a program guide including an icon-based hierarchical program guide including the program schedule information, and display apparatus for displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system, the method including providing a television network, and transmitting program schedule information to a multiplicity of subscriber units, each subscriber unit performing the following steps receiving the program schedule information from the television network, storing at least one viewer preference profile of at least one television viewer, employing an intelligent agent to customize the program schedule information based, at least in part, on the viewer preference profile, to produce a program guide including customized program schedule information, and displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system including a television network and transmitting apparatus for transmitting program schedule information, the method including receiving the program schedule information, storing at least one viewer preference profile of at least one television viewer, employing an intelligent agent to customize the program schedule information based, at least in part, on the viewer preference profile, to produce a program guide including customized program schedule information, and displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system, the method including providing a television network, and transmitting program schedule information to a multiplicity of subscriber units, wherein the step of transmitting includes storing at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, employing an intelligent agent to customize the program schedule information based, at least in part, on the viewer preference profile, to produce customized program schedule information, transmitting the customized program schedule information to the one of the multiplicity of subscriber units, receiving, at the one of the multiplicity of subscriber units, the customized program schedule information from the television network, and displaying a program guide including the customized program schedule information.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system including a television network and transmitting apparatus for transmitting customized program schedule information, the method including storing at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, and customizing the program schedule information based, at least in part, on the viewer preference profile, to produce customized program schedule information.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system, the method including providing a television network, and transmitting program schedule information to a multiplicity of subscriber units, each subscriber unit performing the following steps receiving the program schedule information, producing a program guide including an icon-based hierarchical program guide including the program schedule information, and displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system including a television network and transmitting apparatus for transmitting program schedule information, the method including receiving the program schedule information, producing a program guide including an icon-based hierarchical program guide including the program schedule information, and displaying the program guide.

There is also provided in accordance with another preferred embodiment of the present invention a headend for use in a television system including a television network and transmitting apparatus for transmitting customized program schedule information to a multiplicity of subscriber units, the transmitting apparatus including the headend, the headend including a profile creation unit for creating at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, based on viewer information associated with the one of the multiplicity of subscriber units, and a transmission unit for transmitting the at least one viewer preference profile to the one of the multiplicity of subscriber units.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system including a television network and transmitting apparatus for transmitting customized program schedule information to a multiplicity of subscriber units, the method including creating at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, based on viewer information associated with the one of the multiplicity of subscriber units, and transmitting the at least one viewer preference profile to the one of the multiplicity of subscriber units.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a viewer preference profile in a television system including a plurality of subscriber units, the method including recording, at a first subscriber unit, a viewer preference profile on a removable medium, loading, at a second subscriber unit, the viewer preference profile from the recording medium, and customizing a program guide, at the second subscriber unit, based, at least in part, on the viewer preference profile.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing audience information to a viewer of a television system, the method including collecting viewing data from a multiplicity of viewers of a television system, computing audience information from the collected viewing data, and transmitting the computed audience information to a viewer of the television system.

Further in accordance with a preferred embodiment of the present invention the method also includes displaying the computed audience information to the viewer of the television system.

Still further in accordance with a preferred embodiment of the present invention the computed audience information comprises real-time computed audience information.

There is also provided in accordance with another preferred embodiment of the present invention a method for providing a program guide in a television system comprising a television network and transmitting apparatus for transmitting information to a multiplicity of subscriber units, the method including creating at least one viewer preference profile of at least one television viewer associated with one of the multiplicity of subscriber units, based on viewer information associated with the one of the multiplicity of subscriber units, creating a customized program guide based, at least in part, on the at least one viewer preference profile, and transmitting the customized program guide to the one of the multiplicity of subscriber units.

Further in accordance with a preferred embodiment of the present invention the transmitting step includes transmitting via at least one of the following: conventional mail, electronic mail, provision of a World Wide Web site comprising said customized program guide, and wireless transmission to a portable electronic receiving device.

Still further in accordance with a preferred embodiment of the present invention the icon-based hierarchical program guide includes a plurality of icons, and at least one of the

plurality of icons is associated with additional information, the additional information being provided to a user upon request.

Additionally in accordance with a preferred embodiment of the present invention the additional information includes at least one of the following: audio material; visual material; audio-visual material; multimedia material; a computer program; and at least one preview of at least one program.

Moreover in accordance with a preferred embodiment of the present invention the additional information includes a plurality of customized items of information, and at least one of the plurality of customized items of information is provided to the user based, at least in part, on at least one of the following: a user preference; a conditional access parameter; and a region in which said user is located.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

FIG. **1** is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with a preferred embodiment of the present invention;

FIG. **2** is a simplified block diagram illustration of a portion of the apparatus of FIG. **1**;

FIG. **3** is a simplified block diagram illustration of a preferred implementation of the intelligent agent of FIG. **2**;

FIG. **4** is a simplified flowchart illustration of a preferred method of operation of the viewing information analysis apparatus of FIG. **3**;

FIG. **5** is a simplified flowchart illustration of a preferred implementation of step **260** of FIG. **4**;

FIG. **6** is a simplified flowchart illustration of a preferred method of determining whether a viewer is engaged in surfing behavior in step **280** of FIG. **5**;

FIG. **7** is a simplified flowchart illustration of a preferred method of operation of the program schedule customization apparatus of FIG. **3**;

FIG. **8A** is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with an alternative preferred embodiment of the present invention;

FIG. **8B** is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with another alternative preferred embodiment of the present invention; and

FIGS. **9A–9L** are simplified pictorial representations of preferred embodiments of an electronic program guide, which may be displayed on the display of FIG. **1**, FIG. **8A**, or FIG. **8B**.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Reference is now made to FIG. **1** which is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with a preferred embodiment of the present invention. The apparatus of FIG. **1** comprises display apparatus **100** for display of an electronic program guide, the display apparatus **100** typically comprising a television set as shown in FIG. **1**. The television set may comprise any suitable commercially available television set.

It is appreciated that the display apparatus **100** may alternatively comprise any other suitable display apparatus such as, for example, a computer display, another suitable display, or suitable projection equipment, as is well known in the art. In a case where a display other than a television set is used, it is appreciated that a television set is typically provided separately. For the purpose of simplicity in description, a case where the display apparatus **100** comprises a television set is generally described throughout the present specification, but it is appreciated that another type of appropriate display apparatus may generally be used.

On the display apparatus **100** an on-screen alert **105** is shown. The on-screen alert **105** is described more fully below. The on-screen alert **105** is shown as an example of a component of an electronic program guide, as described below. It is appreciated that the electronic program guide may take a wide variety of forms and that, typically, the on-screen alert **105** is comprised in the electronic program guide and that the electronic program guide may comprise other components alternatively, or in addition to, the on-screen alert **105**.

The apparatus of FIG. **1** also comprises an interface unit **110**. The interface unit **110** is also known as a set top box (STB). The interface unit **110** is operative to provide a least a one-way interface, and optionally a two-way interface, between the display apparatus **100** and a television network, which may be either a pay television network or a non-pay or free television network. It is appreciated that, in certain preferred embodiments of the present invention such as, for example, the embodiments of FIGS. **8A** and **8B**, described below, a two-way interface is preferable. The interface unit **110** typically comprises a variety of conventional STB components (not shown), as is well known in the art, to receive, tune and, as necessary, decode television broadcasts received from the television network and to send display signals representing the received broadcasts to the display apparatus **100**.

The interface unit **110** also typically comprises a receiving unit **120**, an intelligent agent **130**, and a profile storage unit **140**, the receiving unit **120** and the profile storage unit **140** being operatively attached to the intelligent agent **130**. The receiving unit **120**, the intelligent agent **130**, and the profile storage unit **140** are typically implemented in software in one or more suitable microprocessors suitably equipped with memory, but it is appreciated that a hardware implementation may also be used. The functions of the receiving unit **120**, the intelligent agent **130**, and the profile storage unit **140** are described in more detail below. The apparatus of FIG. **1** may also comprise a recording device such as a VCR (not shown), or any other appropriate conventional recording device, including a DVCR (digital VCR) or DVD (digital video disc) recording device.

The operation of the apparatus of FIG. **1** is now briefly described. The interface unit **110** receives television broadcasts from the television network. A user of the apparatus of FIG. **1** chooses a channel to watch, using means well-known in the art such as, for example, a commercially-available remote control unit. The interface unit **110**, responsive to the user's choice of channel, transmits display signals representing received broadcasts on the chosen channel to the display apparatus **100**, as is well-known in the art.

As is well-known in the art, the television broadcasts typically also comprise television program schedule information. It is appreciated that program schedule information may alternatively or additionally be distributed by other non-broadcast methods such as, for example: by sending a

removable medium to the user for insertion in an appropriate unit (not shown) for receiving the medium in the apparatus of FIG. **1**; by publishing coded information, such as in a newspaper or magazine, and by providing equipment (not shown) for use with the apparatus of FIG. **1** to read the coded information into the apparatus of FIG. **1**; or otherwise.

The terms "program schedule information" and "television program schedule information" are used interchangeably throughout the present specification and claims to refer to information describing a television program schedule. Program schedule information is typically intended to assist a television viewer in choosing a television program to watch, either at the current time or in the future. Program schedule information typically comprises one or more of the following:

channel number;
starting date;
starting time;
ending date;
ending time;
name of program;
description of program;
name of at least one actor in program;
name of director of program;
program provider;
price of program; and
classification criteria.

The classification criteria may typically comprise one or more of the following: indications of whether the program is a comedy, a drama, a documentary, a news program, etc.; an indication of whether the program contains material unsuited for younger viewers; the country of origin of the program; and any other appropriate classification criteria. A typical example of such criteria is described in DVB standard ETS 300–468, referred to above.

Reference is now additionally made to FIG. **2**, which is a simplified block diagram illustration of a portion of the apparatus of FIG. **1**. The apparatus of FIG. **2** comprises the receiving unit **120**, the intelligent agent **130**, the profile storage unit **140**, and the display apparatus **150** of FIG. **2**, and illustrates the connections therebetween as well as the inputs thereto and outputs therefrom. The apparatus of FIG. **2** also comprises an optional viewer preference profile loading apparatus **160** (not shown in FIG. **1**), described below.

The receiving unit **120** is typically operative to receive the program schedule information from the television network and to pass the program schedule information to the intelligent agent **130**. The receiving unit **120** may also be operative, as is well known in the art, to filter the program schedule information from other information broadcast via the television network, such as television programs, thus producing the information passed by the receiving unit **120** to the intelligent agent **130**. The intelligent agent **130** also typically receives television viewing information representing current television viewing behavior of one or more individual viewers. The television viewing information, typically comprising an indication of the channel currently being watched and, optionally, viewer identification information, may be received from conventional components of the interface unit **110**, as is well known in the art, or from another appropriate source.

It is appreciated that, in a case where the television viewing information comprises viewer identification information, the viewer identification information is typically obtained using methods well-known in the art for identifying viewers such as, for example, requiring one or more viewers to supply identifying information such as, for example, a personal identification number (PIN) before viewing television. Thus, the television viewing information may be associated with one or more viewers. It is also appreciated that, in a case where the television viewing information does not comprise viewer identification information the television viewing information is preferably taken to be general, that is, not to be associated with any particular viewer. For the sake of simplicity in description, a case where the television viewing information is associated with one or more viewers is generally described herein, but it is appreciated that the present invention also applies to the case where the television viewing information is not associated with any particular viewer.

The intelligent agent **130** is preferably operable to combine the television viewing information with the program schedule information and to extract therefrom characteristics, typically comprising components similar to those described above with respect to program schedule information, which characterize the television program currently being viewed by the viewer. Such components are also known herein as current program characteristics. The intelligent agent **130** is typically operative to store the current program characteristics in a viewer preference profile, typically in the profile storage unit **140**, the viewer preference profile typically comprising information, obtained over a period of time, on the various current program characteristics of programs viewed by a viewer at various times. The period of time may be as short as a few minutes or as long as a year or more. The viewer preference profile also typically comprises information on the amount of time or proportion of duration of the program during which each program was viewed by the viewer.

Typically, the viewer preference profile may contain information on preference strength, that is, on how strongly a certain program or type of program is preferred by the viewer. Preference strength may reflect the number of times that the program was viewed in a given period of time, the percentage of all occurrences of the program that were viewed, or any other appropriate criterion. Typically, the viewer preference profile is accumulated over an unlimited amount of time. Alternatively, old information may be eliminated from the profile or the profile may be reset upon receipt of a signal from the television network.

Optionally, the apparatus of FIG. **1** may be operative to display a viewer preference profile on the display apparatus **100** or otherwise and to allow the viewer to edit or otherwise modify the viewer preference profile, typically using user interface methods well known in the art. In this case, the viewer is preferably enabled to add, delete, or modify any information in the viewer's viewer preference profile, it being appreciated that the apparatus of FIG. **1** is preferably operative to provide an appropriate questionnaire or other assisted data input method, as is well known in the art, in order to assist the viewer in adding, deleting, or modifying information. Particularly, the viewer is preferably enabled to provide information on programs or types of programs which the viewer prefers to view or prefers not to view. Furthermore, the viewer is preferably enabled to do one or more of the following:

turn off or on the collection of viewer preference profile information;
define different levels of highlighting, as described below;
turn the delivery of alerts on or off;
instruct the apparatus of FIG. **1** to include or not to include popular programs in the program guide;

instruct the apparatus of FIG. **1** to include or not to include programs having a certain rating, such as programs having a rating as unsuitable for children, in the program guide;

instruct the apparatus of FIG. **1** to include or not to include programs recommended by one or more critics in the program guide; and

perform any other appropriate action.

As described below, the viewer preference profile stored by the intelligent agent **130** and used as described below may comprise a simple data structure describing current program characteristics of programs viewed by a viewer and other information as stated above. It is appreciated, however, that the viewer preference profile may, in alternative embodiments of the present invention, take a wide variety of forms. For example, without limiting the generality of the foregoing, the viewer preference profile may comprise one or more rules abstracted from at least the current program characteristics of programs viewed by a viewer, the extraction and/or abstraction of such rules from the current program characteristics of programs viewed by a viewer and other information as stated above being possible using methods well-known in the art, particularly methods in use with rule-based expert systems.

Such rules, as is well known in the art, may comprise conditions and results to be carried out if the conditions are true. For example, such a rule might state that if the user preference level for news is greater than a given threshold and if a news program is scheduled within the next 30 minutes, a news alert should be presented on the screen. For the sake of simplicity in description, the case of a simple data structure will generally be described below, it being appreciated that other methods, such as, for example, a rule-based method, may also be used.

The intelligent agent **130** is also operative to customize the program schedule information received from the receiving unit **120** in accordance with one or more viewer preference profiles belonging to one or more viewers and to output a program guide comprising the customized program schedule information to the display apparatus **150** for display. It is appreciated that, in a case where more than one viewer preference profile is used, the plurality of viewer preference profiles may be combined by any appropriate method, including simply combining the profiles, giving complete preference to one profile over another profile, giving partial preference to one profile over another profile, or by any other appropriate combining method.

The term "customize" in its various forms, as used throughout the present specification and claims with reference to program schedule information to be comprised in a program guide, is used generally to refer to any kind of customization including, for example, one or more of the following:

changing the order in which programs appear in the program guide;

changing the order in which channels appear in the program guide;

removing certain programs from or adding certain programs to the program guide, the added programs typically comprising programs that were not previously displayed due to another customization;

highlighting or emphasizing certain programs in the program guide, possibly including multiple levels of highlighting or emphasis;

de-highlighting or deemphasizing certain programs in the program guide, possibly including multiple levels of de-highlighting or de-emphasis;

modifying a hierarchy, such as, for example, an icon-based hierarchy, of programs in the program guide;

modifying the appearance of an element of the program guide such as, for example, an icon, including modifying an icon to be non-objectionable for viewing by children;

displaying an alert comprising program schedule information;

customizing a channel to contain selected programs from the program guide, typically by creating a virtual channel comprising, for example, a list of times and channels on which preferred programs are broadcast at those times, to give a viewer the appearance that the viewer's preferred programs are all broadcast on the customized channel;

delivering an alert remind the viewer to record a program;

automatically recording a program; and

any other appropriate kind of customization.

It is appreciated that other factors in addition to a viewer preference profile may also be applied by the intelligent agent **130**. Examples of such other factors and their typical use by the intelligent agent **130** include the following:

parental control information, which is well known in the art, may be used to eliminate certain programs from the program guide or to modify objectionable descriptions and/or icons so that they are suitable for viewing by children;

parental control or other information may be used to limit total viewing time or viewing during certain times of the day by removing programs falling outside the limitation from the program guide;

subscription information, typically including information on television services which have been subscribed to by a viewer, may be used to eliminate programs not subscribed for from the program guide;

rating information, typically including information on general viewer popularity of a program based on ratings as are well known in the art, may be used to modify the customization of the program guide, typically by including or promoting the importance of highly rated programs but possibly by excluding or reducing the importance of highly rated programs, and further possibly by modifying the viewer preference profile based on the rating information; and

language choice information, typically including information on a preferred language, may be used to display listings in a particular language or for program versions in a particular language, it being appreciated that viewer preference profile information on language viewing preferences may override language choice information.

The optional viewer preference profile loading apparatus **160**, if present, may be used to load a recorded viewer preference profile of another viewer, including a viewer who has used another apparatus, similar to that of FIG. **1**, at a different time and place. Such a recorded viewer preference profile may be provided on any appropriate recording medium, may be broadcast via the television network, or may be delivered from profile storage apparatus by any appropriate means. It is appreciated that a recorded viewer preference profile may typically be a profile of a well-known person, may be intended to provide customization of the program guide in a way similar to that which would be provided to the famous person, and may be provided for a fee or other consideration. The effect of using such a

recorded viewer preference profile would be, approximately, to receive a customized program guide customized according to the preferences of the person who is the source of the recorded viewer preference profile.

Alternatively, a recorded viewer preference profile could be used as an anti-profile in the sense that customization could occur opposite to what would be the result of using the recorded preference profile; that is, a particular program that was preferred according to the recorded viewer preference profile could be, for example, deemphasized.

Optionally, the profile loading apparatus **160**, if present, may also be operative to record a viewer preference profile on any appropriate recording medium such as, for example, a diskette or an appropriate smart card. The recorded viewer preference profile may then be provided to another viewer having apparatus similar to that of FIG. **1** for loading as described above.

It is appreciated that the implementation of the present invention described above, wherein a program guide is transmitted to a television, comprises one particular implementation of the present invention, and that the scope of the present invention is not limited by the above-described implementation. In particular, it is appreciated that, with minor variations as is well known in the art, a customized program guide could be delivered to a viewer by, for example, one or more of the following methods:

conventional mail;

electronic mail, including conventional electronic mail, electronic mail delivered to a television, text-based electronic mail, graphics-based electronic mail, HTML-based electronic mail, or any other suitable type of electronic mail;

a personalized World Wide Web site on the Internet; and

wireless delivery to a portable electronic device such as a suitable beeper, palmtop device, personal organizer, watch, radio receiver, or any other suitable portable electronic device.

Reference is now made to FIG. **3**, which is a simplified block diagram illustration of a preferred implementation of the intelligent agent **130** of FIG. **2**. The apparatus of FIG. **3** preferably comprises viewing information analysis apparatus **170**, which typically receives program schedule information from the receiving unit **120** of FIG. **2**, as described above, as well as receiving television viewing information, as described above with reference to FIG. **2**.

The apparatus of FIG. **3** also preferably comprises viewer preference profile update and storage apparatus **180**. The viewing information and analysis apparatus **170** is preferably operative to provide current program information and information on the current viewer, typically comprised in the television viewing information, as described above with reference to FIG. **2**, to the update and storage apparatus **180**. The update and storage apparatus **180** is preferably operative to store the received information in an appropriate viewer preference profile in the profile storage unit **140** of FIG. **2**.

The apparatus of FIG. **3** also preferably comprises viewer preference profile retrieval apparatus **190** and program schedule customization apparatus **200**. The retrieval apparatus **190** typically retrieves the viewer preference profile of a viewer under control of the program schedule customization apparatus **200** and sends the viewer preference profile to the program schedule customization apparatus **200**.

The program schedule customization apparatus **200** preferably receives the viewer preference profile, as well as the program schedule information from the receiving unit **120** of FIG. **2**. The program schedule customization apparatus **200** is preferably operative to customize the program schedule information received from the receiving unit **120** in accordance with one or more viewer preference profiles belonging to one or more viewers and to output a program guide comprising the customized program schedule information.

The viewing information analysis apparatus **170**, the viewer preference profile update and storage apparatus **180**, the view preference profile retrieval apparatus **190**, and the program schedule customization apparatus **200** are typically implemented in software in one or more suitable microprocessors suitably equipped with memory, but it is appreciated that a hardware implementation may also be used.

Reference is now made to FIG. **4**, which is a simplified flowchart illustration of a preferred method of operation of the viewing information analysis apparatus of FIG. **3**. The method of FIG. **4** preferably includes the following steps:

When program schedule information is received, the information is processed (step **210**). Program schedule information is generally received when the program schedule information is sent over the television network. The program schedule information may be sent periodically, may be sent when there is a change in program schedule information, or may be sent at other times. Processing program schedule information preferably comprises updating a working copy of program schedule information kept in the intelligent agent **130** and used in other steps of the method of FIG. **4**.

A check is made as to whether television viewing information has been received (step **220**). Generally, television viewing information is received when there is a change in television viewing such as, for example: a new viewer begins viewing television according to viewer identification information; a television channel change occurs; or the television is turned on or turned off. Television viewing information may also comprise an indication that a viewer has responded to a customized alert positively, by tuning to the program named in the alert, or negatively, by not tuning to the program named in the alert. Preferably, such a positive response is taken to reinforce the preference which led to the alert. A negative response, on the other hand, is preferably taken to weaken or erase the preference which led to the alert.

If no television viewing information is received, the process of FIG. **4** preferably ends.

It is appreciated that, after step **220**, further action need only be taken when some television viewing information is received, on the assumption that eventually some change in television viewing will occur and further action can be taken at that time. It is further appreciated that, to prevent a possibility of no television viewing information being received for a very long time such as, for example, for an entire day, step **220** may include a check for a very long time having passed since television information has been received and, in that case, the check of step **220** may preferably behave as if television viewing information, comprising viewed program information, has been received, in order to ensure that current television viewing information, even if unchanged, is eventually stored.

If television viewing information is found to have been received in step **220**, a check is made as to whether the television viewing information comprises viewer identification information (step **230**). If viewer identification information has been received, the identification of the current user is noted and preferably stored (step **240**). Processing continues with step **260**, described below.

If the check of step **230** does not show receipt of viewer identification information, a check is made as to whether viewed program information has been received (step **250**). If not, the method of FIG. **4** preferably ends. If viewed

program information was found to have been received in step **250**, processing continues with step **260**.

In step **260**, viewed program information and/or viewer identification information are processed.

Reference is now made to FIG. **5**, which is a simplified flowchart illustration of a preferred implementation of step **260** of FIG. **4**. The method of FIG. **5** preferably comprises the following steps:

Checks are made as to whether the current viewer is a new viewer (step **270**) and whether the end of the previous program has been reached, whether by a change in television viewing information or by reaching the end of a program according to the program schedule information (step **290**). If either the check of step **270** or the check of step **290** is found to be true, new profile information is output. (step **280**). The new profile information typically includes viewed program and viewer information.

In a case where the viewed program and viewer information indicate that the viewer has viewed a program for a short period of time, the new profile information may include surfing information, that is, an indication that the viewer prefers to surf, that is, to view programs only for a short period of time. The short period of time typically comprises a predetermined period of time, also termed herein a threshold.

The surfing information may include details such as, for example, how often the user surfs and for how long the user surfs. Alternatively, information about a program which the viewer has viewed for a short period of time may be ignored and may not be included in the new profile information. The term "short period of time", as used in the context of the explanation of step **280**, may include one or more of the following:

- a short absolute period of time such as, for example, less time than a threshold measured in minutes, for example, 2 minutes or 5 minutes; and
- a short relative period of time such as, for example, less than a certain percentage of the scheduled time of a program.

It is appreciated that the short period of time may vary in length according to time of day, day of week, day of year, price of a particular program, or according to any other appropriate criterion. It is further appreciated that, in a case where a viewer views different portions of a program, the times during which each portion was viewed are preferably added before comparison to the threshold.

When the profile information includes information indicating that the viewer prefers to surf, customized electronic program guide information based on the profile information may be tailored for a viewer who prefers to surf, by including randomized program selections as preferred program selections, for example.

Reference is now made to FIG. **6**, which is a simplified flowchart illustration of a preferred method of determining whether a viewer is engaged in surfing behavior in step **280** of FIG. **5**. The method of FIG. **6** is self-explanatory.

It is appreciated that the method described above with reference to FIGS. **4–6** is one particular embodiment of a method of operation of the viewing information analysis apparatus of FIG. **3**. The method of FIG. **4–6** is provided by way of example only, and it is appreciated that other methods, including methods based on rule-based expert systems, as are well known in the art, may also be used.

FIG. **7** is a simplified flowchart illustration of a preferred method of operation of the program schedule customization apparatus **200** of FIG. **3**. The method of FIG. **7** preferably comprises the following steps:

The program schedule customization apparatus receives program schedule information (step **300**) and at least one viewer preference profile (step **310**).

The program schedule customization apparatus then preferably identifies preferred programs by applying the at least one viewer preference profile to the program schedule information (step **320**). It is appreciated that similar results could be obtained by modifying step **320** to identify the programs which are not preferred, and then modifying the remainder of the method of FIG. **7** accordingly.

It is also appreciated that, depending on the form of the viewer preference profiles, as described above with reference to FIG. **2**, the implementation details of step **320** will vary accordingly. For example, in a case where the viewer preference profile comprises a simple data structure describing current program characteristics of programs viewed by a viewer and other information, a preferred implementation of step **320** may comprise comparing the program schedule information to the information stored in the data structure and determining that programs in the program schedule whose characteristics resemble information stored in the data structure are preferred. For example, if information stored in the data structure indicates that news programs starting at 8:00 PM or later are preferred, such a news program will be identified as preferred in step **320**. In a case where the viewer preference profile comprises rules, for example, the rules will typically be applied to the program schedule information, as is well known in the art, to determine which programs are preferred.

The program schedule is then customized (step **330**). As described above with reference to FIG. **2**, such customization may take a wide variety of forms.

Reference is now made to FIG. **8A**, which is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with an alternative preferred embodiment of the present invention. The system of FIG. **8A** is similar to the system of FIG. **1**, except as described below.

The system of FIG. **8A** comprises a headend **340** comprised in or operatively associated with a television network **350**. The headend **340** may be similar to conventional television system headends, as are well known in the art, except as described below.

The headend **340** comprises a headend intelligent agent **360** and a headend profile storage unit **370**, which may be similar respectively to the intelligent agent **130** of FIG. **1** and the profile storage unit **140** of FIG. **1**, respectively, except as follows.

Television viewing information may be transmitted to the headend **340** by a modem **375**, which may be any conventional modem such as, for example, a telephone modem connected to a telephone network or a cable modem connected to a cable network. The modem **375** is typically comprised in or operatively associated with the interface unit **110**. Alternatively, any appropriate means of communicating between the interface unit **110** and the headend **340** may be supplied, such as, for example, a VSAT satellite connection (not shown), as is well known in the art. The received television viewing information is processed in a manner similar to that described above with reference to the embodiment of FIG. **1**.

The headend profile storage unit **370** is typically operative to store viewer preferences profiles for a wide variety of viewers located at a multiplicity of sites. The intelligent agent **360** is operative to receive one or more viewer preference profiles associated with a particular site, such as a site **380**, and to prepare customized program schedule information intended for the particular site. In the embodiment of FIG. **8A** the headend **340** is operative to deliver the customized program schedule information to the particular site using methods well known in the art.

It is appreciated that, generally, the embodiment of FIG. 8A differs from the embodiment of FIG. **1** in that processing and storage largely occur in the headend **340**. The embodiment of FIG. **8A** may be preferable in a case where processing power may be provided more economically in a headend or in other cases. Furthermore, it is appreciated that, in the embodiment of FIG. **8A**, certain types of customization may occur at the headend based on user preference profiles. For example, if users tend to prefer to watch a certain type of movie at a certain hour or hours of the night, that type of movie may be broadcast, either conventionally or in a near-video-on-demand system, at that hour or hours of the night. It is appreciated that other types of customization, as referred to above with respect to FIG. **2**, may also occur at the headend.

It is further appreciated that other types of data processing and analysis may occur at the headend **340**, the other types of data processing and analysis typically being directed to provide additional programming information to viewers. Without limiting the generality of the foregoing, it is appreciated that, at the headend **340**, real-time information on a proportion or percentage of the audience viewing a particular program may be computed. The term "audience", as used throughout the present specification and claims, refers either to the sum total audience viewing all programs at a particular time, or to the total audience of viewers who are capable of receiving programs at a particular time. The real-time information may then be transmitted to subscribers and display information derived from the transmitted information may then be displayed on the display apparatus **100**.

Typically, the display information may comprise an alert to a user of the display apparatus **100**, similar to the alert **105**, informing the user that a program on another channel is currently being viewed by a large proportion of the audience and optionally suggesting that the user tune to that program or offering the user a shortcut, as is well known in the art of television broadcasting, to quickly tune to that program. Alternatively, any appropriate method of displaying the display information, such as displaying a bar graph or other graph indicating the proportion of the audience currently viewing the program presently being viewed by the user or the proportion currently viewing some other program, may be used. It is appreciated that the display information may be displayed, for example, at one or more of the following times: throughout viewing of a program; for a short time when a user tunes to a program, and on demand by a user, typically expressed by pressing a designated button on a remote control unit (not shown) as is well known in the art.

Reference is now made to FIG. **8B** which is a simplified partly pictorial, partly block diagram illustration of a television system comprising a subscriber unit constructed and operative in accordance with another alternative preferred embodiment of the present invention. The system of FIG. **8B** is similar to the system of FIG. **8A**, except that in FIG. **8B** the profile storage unit **370** and the intelligent agent **360** are comprised in the interface unit **110**.

The operation of the system of FIG. **8B** is similar to the operation of the system of FIG. **8A**, except that in the operation of the system of FIG. **8B** the headend **340** is operative to deliver a user preference profile which is typically different for each site, along with program schedule information which is typically the same for each site. It is appreciated that the user preference profile may be delivered only relatively infrequently such as, for example, once per day or once per month or even less often, in which case the embodiment of FIG. **8B** might be preferred because of a relatively small bandwidth required to deliver the user preference profile and the program schedule information.

Reference is now made to FIGS. **9A–9L**, which are simplified pictorial representations of preferred embodiments of an electronic program guide, which may be displayed on the display of FIG. **1**, of FIG. **8A**, or of FIG. **8B**. Each of FIGS. **9A–9L** comprises, as described below, one screen display which may be part of an electronic program guide. For the purposes of the discussion below of FIGS. **9A–9L** it is assumed that the viewer preference profile governing electronic program guide customization shows a preference for news programs beginning at 8:00 PM or later. It is appreciated that the same principles shown and described with reference to FIGS. **9A–9L** apply to a wide variety of viewer preference profiles, including viewer preference profiles which are much more complicated than the given example.

The screen display of FIG. **9A** shows a typical simplified example of a non-customized grid-type screen display, with time being shown in a first dimension and television channels being shown in a second dimension, the resulting grid being filled in with names of television programs scheduled for the indicated time and the indicated channel. As is well known in the art, various navigation techniques exist for a user of a program guide such as that of FIG. **9A** to choose a given program, obtain more information about the program, book the program for future viewing, etc.

The screen display of FIG. **9B** shows a typical simplified example of the screen display of FIG. **9A** after customization. In FIG. **9B**, news programs beginning at 8:00 PM or later are emphasized. It is appreciated that, as described above, such emphasis may be by highlighting, by a change in color, or by other means. It is appreciated that such highlighting, change in color, or other means may comprise a multi-valued scale, such that, for example, different kinds of highlighting or different colors may represent different levels of emphasis.

The screen display of FIG. **9C** shows an alternative typical simplified example of the screen display of FIG. **9A** after customization. In FIG. **9C**, channels having news programs beginning at 8:00 PM or later have been reordered to appear at the beginning of the list of channels. It is appreciated that, in addition to reordering, emphasis as described above with reference to FIG. **9B** may also be used.

The screen display of FIG. **9D** shows a typical simplified example of an icon-based non-customized electronic program guide. In FIG. **9D**, the icons **390** on the screen display represent program subject matter such as, for example, comedy programs or, as indicated by a news icon **395**, news programs and, as indicated by a drama icon **397**, drama programs. The viewer may preferably select, using methods well known in the art such as by moving a cursor and selecting with a mouse (not shown) or other input device well-known in the art, any of the icons **390** of FIG. **9D** in order to obtain more detailed information on programs falling under the selected subject matter. In FIG. **9E**, the icons **390**, such as an 8:00 PM icon **400**, represent particular times at which programs start, and icons may preferably be selected as described above with reference to FIG. **9D**.

It is appreciated that a wide variety of different methods of icon organization may be provided, of which those of FIGS. **9D** and **9E** are only examples. It is further appreciated that, using methods well known in the art, a viewer may choose a method of icon organization or create a custom method of icon organization. For example, icons may be used to represent listings for a particular series of programs or set of related series of programs, including a user-defined

series of programs, which method of organization may be preferable in a case where users desire to see programs of a particular series.

The screen display of FIG. 9F shows a typical simplified example of a screen display after a viewer selects the news icon **395** of FIG. 9D. The screen display of FIG. 9G shows a typical simplified example of a screen display after a viewer selects the 8:00 PM icon **400** of FIG. 9E.

FIGS. 9H–9K show typical simplified examples of the screen displays 9D–9G, respectively, customized to emphasize news programs beginning at 8:00 PM or later. It is appreciated that such icon-based customization may take a wide variety of forms, including: different forms of emphasis; re-ordering the hierarchical relationship between different icons and screens of icons; creating new icons; removing icons; and other forms of icon-based customization. It will be appreciated that such methods of changing the appearance and the hierarchical relationships of icons are well known in the art of computers and that those methods or any other appropriate methods could be applied to the present invention.

It is appreciated that the screen displays of FIGS. 9D–9G may be hierarchical and, generally, may be hierarchical to any desired depth, with a plurality of choices being generally possible at each level, and with many possible selections and/or arrangements of icons displayed at each level. To illustrate another possible level of hierarchy, FIG. **9I** shows a possible hierarchical drama screen that may be displayed after user selection of the drama icon **397** of FIG. 9D.

It is further appreciated that, in FIGS. 9A–9K, any icon may be associated with additional material, which additional material may be presented to the user upon request, such as by pressing a particular button or by any other appropriate method. The additional material preferably comprises any material associated with the subject matter of the icon, particularly material which might help clarify to the user the meaning of the icon and of its underlying content. For example, and without limiting the generality of the foregoing, the additional material may comprise one or more of the following: audio material; visual material; audio-visual material; multimedia material; a computer program or other related material comprising computer instructions or software; and one or more previews of one or more associated programs. Any appropriate method known in the art, such as force tuning to a special program or downloading additional material on demand, may be used to present the additional material to the user.

It is appreciated that the additional material may be particularly useful in systems where one of a plurality of languages and/or dialects is preferred by each user and in cases where very complex character sets, such as, for example, Chinese characters and/or characters in certain other Oriental languages, are used to write a language. In such cases, audio material comprised in the additional material may provide an audio description in cases where providing a written description is technically difficult because of bandwidth limitations in presenting complex character sets or other limitations. In a case where one of a plurality of languages and/or dialects is preferred by each user, the language and/or dialect used in the additional material may be determined by one of the following: user preference information; conditional access parameters such as, for example, geographic information, as is well known in the art; or by any other appropriate method.

It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the invention is defined only by the claims which follow.

What is claimed is:

1. A television system comprising:

a television network; and

transmitting apparatus for transmitting program schedule information to a multiplicity of subscriber units, at least one of said multiplicity of subscriber units including:

a receiving unit for receiving said program schedule information from said television network;

a profile storage unit for storing at least one viewer preference profile of at least one television viewer;

an intelligent agent for customizing said program schedule information based, at least in part, on said viewer preference profile, to produce a program guide comprising customized program schedule information; and

display apparatus for displaying the program guide,

wherein said intelligent agent also comprises profile determination apparatus for determining viewer preference profile information for at least one television viewer and for providing said viewer preference profile information to said profile storage unit for storage as a viewer preference profile, and

said profile determination apparatus determines said viewer preference profile information by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

said profile determination apparatus compares a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length, and

said profile determination apparatus determines said viewer preference profile information based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, said profile determination apparatus determines that said viewer is engaged in channel surfing behavior and said profile determination apparatus determines said viewer preference profile information based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

2. A subscriber unit for use in a television system comprising a television network and transmitting apparatus for transmitting program schedule information, the subscriber unit comprising:

a receiving unit for receiving said program schedule information;

a profile storage unit for storing at least one viewer preference profile of at least one television viewer;

an intelligent agent for customizing said program schedule information based, at least in part, on said viewer

preference profile, to produce a program guide comprising customized program schedule information; and

display apparatus for displaying the program guide,

wherein said intelligent agent also comprises profile determination apparatus for determining viewer preference profile information for at least one television viewer and for providing said viewer preference profile information to said profile storage unit for storage as a viewer preference profile, and

said profile determination apparatus determines said viewer preference profile information by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

said profile determination apparatus compares a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length, and

said profile determination apparatus determines said viewer preference profile information based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, said profile determination apparatus determines that said viewer is engaged in channel surfing behavior and said profile determination apparatus determines said viewer preference profile information based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

3. A television system comprising:

a television network; and

transmitting apparatus for transmitting program schedule information to a multiplicity of subscriber units, the transmitting apparatus comprising a headend, the headend including:

a profile storage unit for storing at least one viewer preference profile of at least one television viewer associated with one of said multiplicity of subscriber units; and

an intelligent agent for customizing said program schedule information based, at least in part, on said viewer preference profile, to produce customized program schedule information,

wherein said transmitting apparatus is operative to transmit the customized program schedule information to said one of said multiplicity of subscriber units, and

at least one of said multiplicity of subscriber units includes:

a receiving unit for receiving said customized program schedule information from said television network; and

display apparatus for displaying a program guide comprising the customized program schedule information,

wherein said intelligent agent also comprises profile determination apparatus for determining viewer preference profile information for at least one television viewer and for providing said viewer preference profile information to said profile storage unit for storage as a viewer preference profile, and

said profile determination apparatus determines said viewer preference profile information by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

said profile determination apparatus compares a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length, and

said profile determination apparatus determines said viewer preference profile information based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, said profile determination apparatus determines that said viewer is engaged in channel surfing behavior and said profile determination apparatus determines said viewer preference profile information based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

4. A headend for use in a television system comprising a television network and transmitting apparatus for transmitting customized program schedule information to at least one subscriber unit, the headend comprising:

a profile storage unit for storing at least one viewer preference profile of at least one television viewer associated with said at least one subscriber unit; and

an intelligent agent for customizing said program schedule information based, at least in part, on said viewer preference profile, to produce customized program schedule information,

wherein said intelligent agent also comprises profile determination apparatus for determining viewer preference profile information for at least one television viewer and for providing said viewer preference profile information to said profile storage unit for storage as a viewer preference profile, and

said profile determination apparatus determines said viewer preference profile information by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

said profile determination apparatus compares a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length, and

said profile determination apparatus determines said viewer preference profile information based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, said profile determination apparatus determines that said viewer is engaged in channel surfing behavior and said profile determination apparatus determines said viewer preference profile information based, at least in part, on said channel surfing behavior by modifying said viewer preference profile

information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

5. Apparatus according to claim 2 and wherein said profile determination apparatus determines viewer preference profile information, at least in part, from a reaction of said at least one television viewer to previously displayed customized program schedule information.

6. Apparatus according to claim 2 and wherein said program schedule information comprises a first plurality of criteria, at least one of said first plurality of criteria being associated with each of a second plurality of television programs, and

said profile determination apparatus determines said viewer preference profile information based, at least in part, on at least one of said plurality of criteria associated with said at least one viewed television program.

7. Apparatus according to claim 2 and wherein said profile determination apparatus determines said viewer preference profile information, at least in part, in accordance with input provided by said at least one television viewer.

8. Apparatus according to claim 2 and also comprising viewer preference profile loading apparatus for providing a recorded viewer preference profile to the profile storage unit for storage.

9. Apparatus according to claim 8 wherein said viewer preference profile loading apparatus receives said recorded viewer preference profile via said television network.

10. Apparatus according to claim 2 and wherein said customizing comprises one of the following: emphasizing at least a portion of said customized program schedule information based, at least in part, on said viewer preference profile; and deemphasizing at least a portion of said customized program schedule information based, at least in part, on said viewer preference profile.

11. Apparatus according to claim 2 and wherein said customizing comprises automatically tuning to a program selected based, at least in part, on said viewer preference profile.

12. Apparatus according to claim 2 and wherein said customizing comprises automatically recording, on recording apparatus, a program selected based, at least in part, on said viewer preference profile.

13. Apparatus according to claim 2 and wherein said display apparatus is operative to display an on-screen alert comprising at least part of said customized program schedule information.

14. Apparatus according to claim 13 and wherein said on-screen alert comprises an unsolicited alert of audience viewing information comprising an indication of a proportion of an audience currently viewing a program.

15. Apparatus according to claim 13 and wherein said display apparatus displays said on-screen alert a predetermined period of time before a scheduled starting time of a television program, said at least part of said customized program schedule information comprising information associated with said television program.

16. Apparatus according to claim 2 and wherein said display apparatus comprises an icon-based guide generator for producing an icon-based hierarchical program guide comprising said program schedule information, and

the program guide comprises the icon-based hierarchical program guide.

17. A method for providing a program guide in a television system, the method comprising:

providing a television network; and

transmitting program schedule information to a multiplicity of subscriber units, each subscriber unit performing the following steps:

receiving said program schedule information from said television network;

storing at least one viewer preference profile of at least one television viewer;

employing an intelligent agent to customize said program schedule information based, at least in part, on said viewer preference profile, to produce a program guide comprising customized program schedule information; and

displaying the program guide,

wherein said intelligent agent determines viewer preference profile information for at least one television viewer and provides said viewer preference profile information for storage as a viewer preference profile, and

said viewer preference profile information is determined by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

the method also includes:

comparing a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length,

wherein said viewer preference profile information is determined based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, a determination is made that said viewer is engaged in channel surfing behavior and said viewer preference profile information is determined based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

18. A method for providing a program guide in a television system comprising a television network and transmitting apparatus for transmitting program schedule information, the method comprising:

receiving said program schedule information;

storing at least one viewer preference profile of at least one television viewer;

employing an intelligent agent to customize said program schedule information based, at least in part, on said viewer preference profile, to produce a program guide comprising customized program schedule information; and

displaying the program guide,

wherein said intelligent agent determines viewer preference profile information for at least one television viewer and provides said viewer preference profile information for storage as a viewer preference profile, and

said viewer preference profile information is determined by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

the method also includes:

comparing a length of said portion of said at least one viewed television program to a predetermined viewing thresbold length to determine whether said length is greater than said threshold length,

wherein said viewer preference profile information is determined based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, a determination is made that said viewer is engaged in channel surfing behavior and said viewer preference profile information is determined based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

19. A method for providing a program guide in a television system, tbe method comprising:

providing a television network; and

transmitting program schedule information to a multiplicity of subscriber units,

wherein the step of transmitting comprises:

storing at least one viewer preference profile of at least one television viewer associated with one of said multiplicity of subscriber units;

employing an intelligent agent to customize said program schedule information based, at least in part, on said viewer preference profile, to produce customized program schedule information;

transmitting the customized program scbedule information to said one of said multiplicity of subscriber units;

receiving, at said one of said multiplicity of subscriber units, said customized program schedule information from said television network; and

displaying a program guide comprising the customized program schedule information,

wherein said intelligent agent determines viewer preference profile information for at least one television viewer and provides said viewer preference profile information for storage as a viewer preference profile, and

said viewer preference profile information is determined by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

tbe method also includes:

comparing a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length,

wherein said viewer preference profile information is determined based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, a determination is made that said viewer is engaged in channel surfing behavior and said viewer preference profile information is determined based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user wbo engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

20. A method for providing a program guide in a television system comprising a television network and transmitting apparatus for transmitting customized program schedule information, tbe method comprising:

storing at least one viewer preference profile of at least one television viewer associated with one of said multiplicity of subscriber units; and

customizing said program schedule information, using an intelligent agent, based, at least in part, on said viewer preference profile, to produce customized program schedule information,

wherein said intelligent agent determines viewer preference profile information for at least one television viewer and provides said viewer preference profile information for storage as a viewer preference profile, and

said viewer preference profile information is determined by monitoring television viewing behavior of said at least one television viewer, and

said television viewing behavior comprises viewing only a portion of at least one viewed television program, and

the method also includes:

comparing a length of said portion of said at least one viewed television program to a predetermined viewing threshold length to determine whether said length is greater than said threshold length,

wherein said viewer preference profile information is determined based, at least in part, on whether said length is greater than said threshold length, and

when said length is determined to be less than said threshold length, a determination is made that said viewer is engaged in channel surfing behavior and said viewer preference profile information is determined based, at least in part, on said channel surfing behavior by modifying said viewer preference profile information to be appropriate for a user who engages in channel surfing behavior, and

said program schedule information includes randomly chosen information.

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COPY OF HENDRICKS ET AL. U.S. PATENT NO. 6,539,548

US006539548B1

(12) **United States Patent**
Hendricks et al.

(10) **Patent No.: US 6,539,548 B1**
(45) **Date of Patent: Mar. 25, 2003**

(54) **OPERATIONS CENTER FOR A TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **08/912,934**

(22) Filed: **Aug. 15, 1997**

Related U.S. Application Data

(63) Continuation of application No. 08/160,282, filed on Dec. 2, 1993, now Pat. No. 5,659,350, which is a continuation-in-part of application No. 07/991,074, filed on Dec. 9, 1992.

(51) **Int. Cl.**[7] **H04N 7/173**

(52) **U.S. Cl.** **725/109**; 725/37; 725/91

(58) **Field of Search** 725/37, 39, 87, 725/91, 92, 93, 94, 95, 96, 97, 114, 115, 116, 117, 138, 143, 144, 145, 146, 147, 86, 109, 68, 67; 348/906, 569, 570, 722

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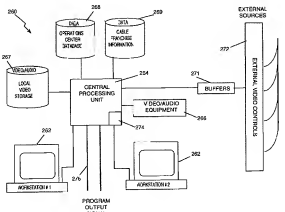
(57) **ABSTRACT**

An Operations Center for television entertainment systems that provide television programming to consumer homes is disclosed. The Operations Center organizes and packages television programming and program information for delivery to and from consumer homes. The Operations Center includes a computerized packaging system for creating a program control information signal.

72 Claims, 86 Drawing Sheets



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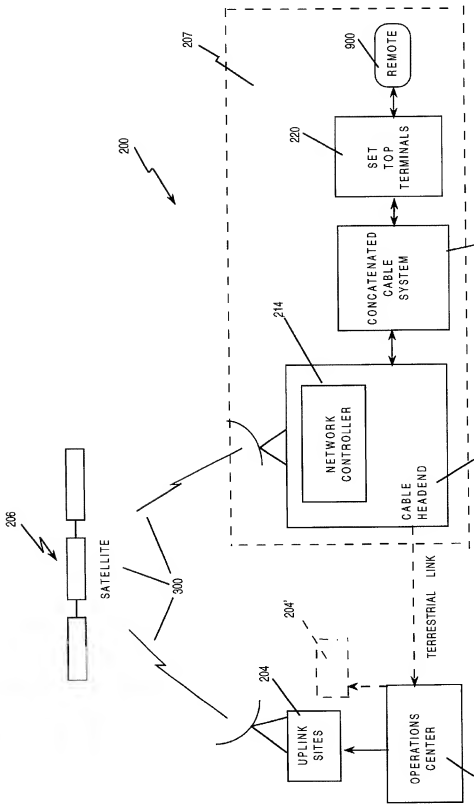

206
SATELLITE
300
204'
204
UPLINK SITES
TERRESTRIAL LINK
OPERATIONS CENTER
202
200
207
214
NETWORK CONTROLLER
CABLE HEADEND
208
CONCATENATED CABLE SYSTEM
210
220
SET TOP TERMINALS
900
REMOTE

Fig. 1

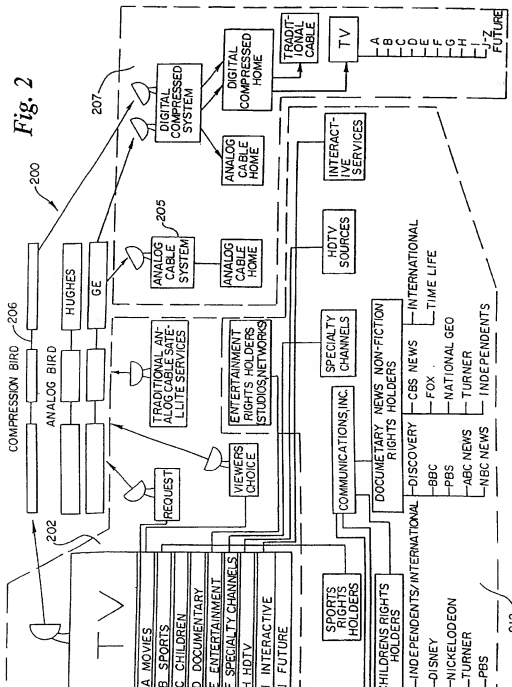
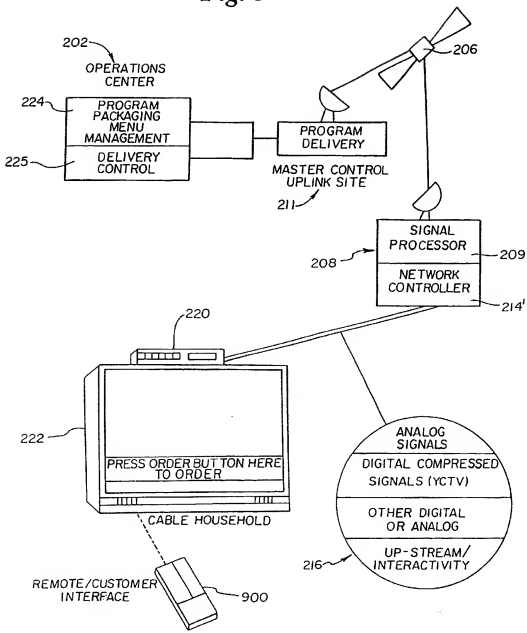


Fig. 2
200
202
206
207
205
212
COMPRESSION BIRD
ANALOG BIRD
HUGHES
GE
TV
A MOVIES
B SPORTS
C CHILDREN
D DOCUMENTARY
E ENTERTAINMENT
F SPECIALTY CHANNELS
H HDTV
I INTERACTIVE
J FUTURE
REQUEST
VIEWERS CHOICE
TRADITIONAL ANALOG CABLE SATELLITE SERVICES
ENTERTAINMENT RIGHTS HOLDERS STUDIOS, NETWORKS
ANALOG CABLE SYSTEM
ANALOG CABLE HOME
DIGITAL COMPRESSED SYSTEM
ANALOG CABLE HOME
DIGITAL COMPRESSED HOME
TRADITIONAL CABLE
TV
A
B
C
D
E
F
G
H
I-Z FUTURE
INTERACTIVE SERVICES
HDTV SOURCES
SPECIALTY CHANNELS
COMMUNICATIONS, INC.
DOCUMENTARY NEWS NON-FICTION RIGHTS HOLDERS
DISCOVERY
BBC
PBS
ABC NEWS
NBC NEWS
CBS NEWS
FOX
NATIONAL GEO
TURNER
INDEPENDENTS
INTERNATIONAL
TIME LIFE
SPORTS RIGHTS HOLDERS
CHILDRENS RIGHTS HOLDERS
INDEPENDENTS/INTERNATIONAL
DISNEY
NICKELODEON
TURNER
PBS

Fig. 3


202
OPERATIONS CENTER
224
PROGRAM PACKAGING MENU MANAGEMENT
225
DELIVERY CONTROL
PROGRAM DELIVERY
206
MASTER CONTROL UPLINK SITE
211
SIGNAL PROCESSOR
209
208
NETWORK CONTROLLER
214'
220
222
PRESS ORDER BUTTON HERE TO ORDER
CABLE HOUSEHOLD
REMOTE/CUSTOMER INTERFACE
900
ANALOG SIGNALS
DIGITAL COMPRESSED SIGNALS (YCTV)
OTHER DIGITAL OR ANALOG
UP-STREAM/ INTERACTIVITY
216

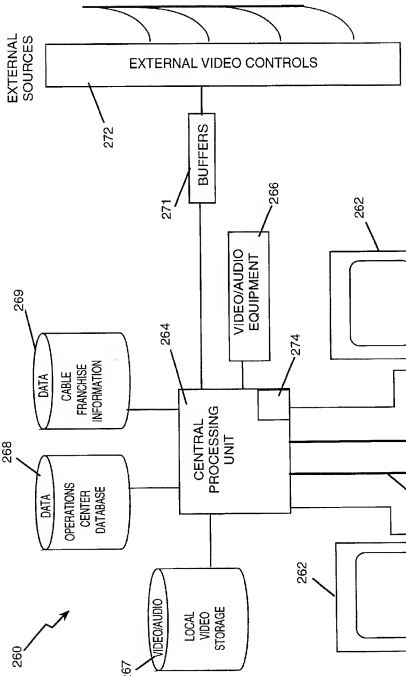

EXTERNAL SOURCES
EXTERNAL VIDEO CONTROLS
272
BUFFERS
271
VIDEO/AUDIO EQUIPMENT
266
262
WORKSTATION # 2
269
DATA
CABLE FRANCHISE INFORMATION
264
274
268
DATA
OPERATIONS CENTER DATABASE
CENTRAL PROCESSING UNIT
PROGRAM OUTPUT SIGNAL
276
262
WORKSTATION # 1
260
267
VIDEO/AUDIO
LOCAL VIDEO STORAGE

Fig. 4

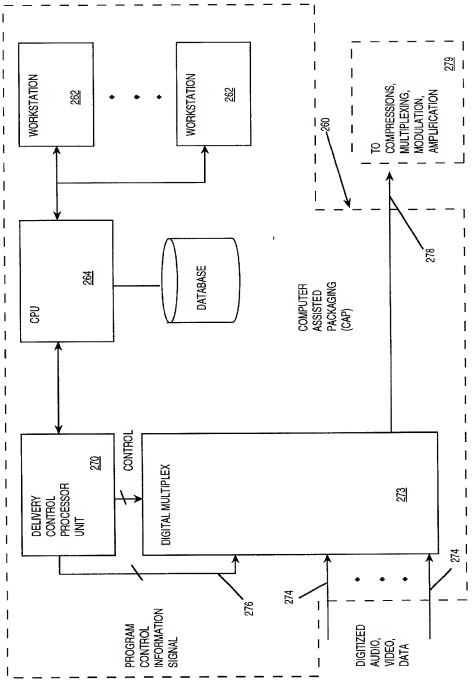

WORKSTATION
262
WORKSTATION
262
CPU
264
DATABASE
DELIVERY CONTROL PROCESSOR UNIT
270
CONTROL
DIGITAL MULTIPLEX
272
COMPUTER ASSISTED PACKAGING (CAP)
280
TO COMPRESSIONS, MULTIPLEXING, MODULATION, AMPLIFICATION
278
PROGRAM CONTROL INFORMATION SIGNAL
276
274
DIGITIZED AUDIO, VIDEO, DATA
274

Fig. 5

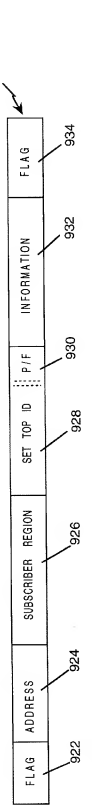

8 BITS
4 BITS
4 BITS
16 BITS
VARIABLE
8 BITS
920
FLAG
ADDRESS
SUBSCRIBER REGION
SET TOP ID
P/F
INFORMATION
FLAG
922
924
926
928
930
932
934

Fig. 6a

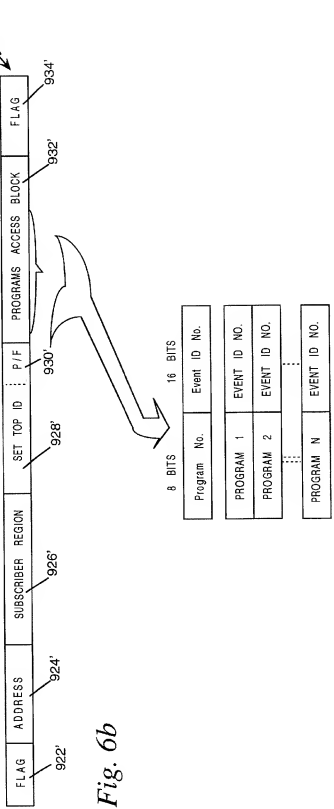

8 BITS
4 BITS
4 BITS
16 BITS
VARIABLE
(24 BITS + N PROGRAMS)
8 BITS
920'
FLAG
ADDRESS
SUBSCRIBER REGION
SET TOP ID
P/F
PROGRAMS ACCESS BLOCK
FLAG
922'
924'
926'
928'
930'
932'
934'
8 BITS
16 BITS
Program No.
Event ID No.
PROGRAM 1
EVENT ID NO.
PROGRAM 2
EVENT ID NO.
PROGRAM N
EVENT ID NO.

Fig. 6b

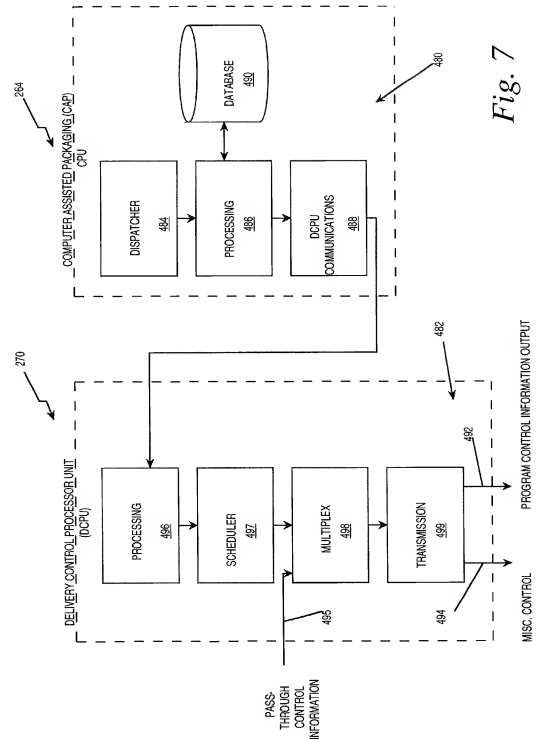

264
COMPUTER ASSISTED PACKAGING (CAP) CPU
DISPATCHER 494
PROCESSING 496
DCPU COMMUNICATIONS 498
DATABASE 450
480
270
DELIVERY CONTROL PROCESSOR UNIT (DCPU)
PROCESSING 496
SCHEDULER 497
MULTIPLEX 498
TRANSMISSION 499
482
492
494
495
PASS-THROUGH CONTROL INFORMATION
MISC. CONTROL
PROGRAM CONTROL INFORMATION OUTPUT

Fig. 7

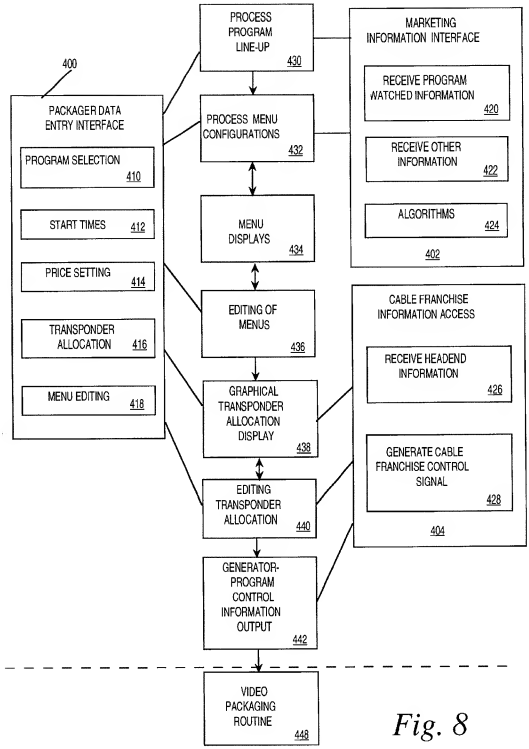

400
PACKAGER DATA ENTRY INTERFACE
PROGRAM SELECTION 410
START TIMES 412
PRICE SETTING 414
TRANSPONDER ALLOCATION 416
MENU EDITING 418
PROCESS PROGRAM LINE-UP 430
PROCESS MENU CONFIGURATIONS 432
MENU DISPLAYS 434
EDITING OF MENUS 436
GRAPHICAL TRANSPONDER ALLOCATION DISPLAY 438
EDITING TRANSPONDER ALLOCATION 440
GENERATOR-PROGRAM CONTROL INFORMATION OUTPUT 442
VIDEO PACKAGING ROUTINE 448
MARKETING INFORMATION INTERFACE
RECEIVE PROGRAM WATCHED INFORMATION 420
RECEIVE OTHER INFORMATION 422
ALGORITHMS 424
402
CABLE FRANCHISE INFORMATION ACCESS
RECEIVE HEADEND INFORMATION 426
GENERATE CABLE FRANCHISE CONTROL SIGNAL 428
404

Fig. 8

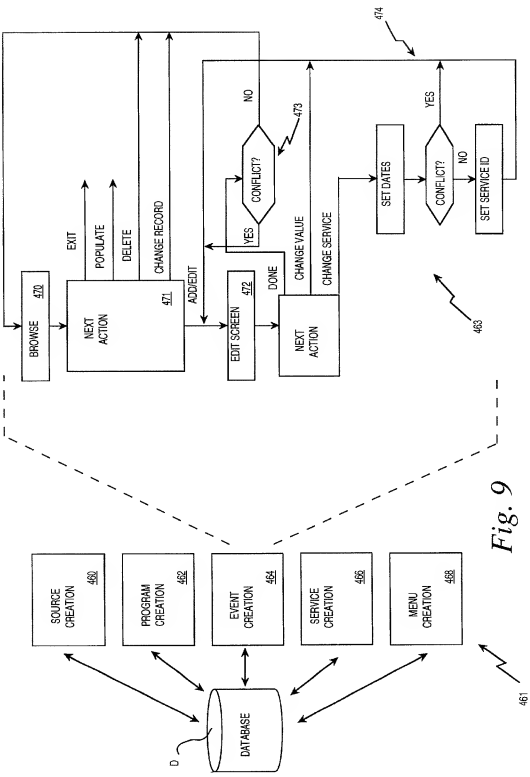
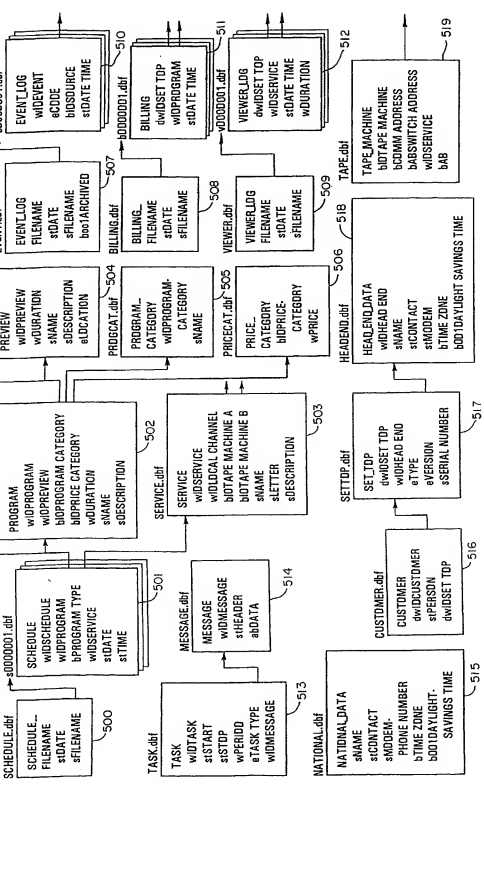

474
NO
473
YES
CONFLICT?
EXIT
POPULATE
DELETE
CHANGE RECORD
ADD/EDIT
CHANGE VALUE
CHANGE SERVICE
DONE
BROWSE
470
NEXT ACTION
471
EDIT SCREEN
472
NEXT ACTION
SET DATES
CONFLICT?
YES
NO
SET SERVICE ID
463
SOURCE CREATION
460
PROGRAM CREATION
462
EVENT CREATION
464
SERVICE CREATION
466
MENU CREATION
468
DATABASE
D
461

Fig. 9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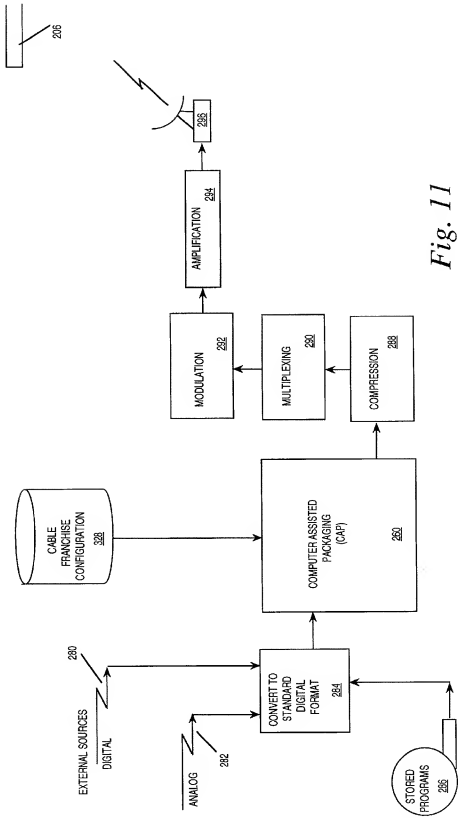
SCHEDULE_
FILENAME
stDATE
sfFILENAME
500
aDDDDD01.dbf
SCHEDULE
wlDSCHEDULE
wlDPROGRAM
bPROGRAM TYPE
wlDSERVICE
stDATE
stTIME
501
PROGRAM.dbf
PROGRAM
wlDPROGRAM
wlDPREVIEW
blOPROGRAM CATEGORY
bIDPRICE CATEGORY
wDURATION
sNAME
sDESCRIPTION
502
SERVICE.dbf
SERVICE
wlDSERVICE
wlDLOCAL CHANNEL
biDTAPE MACHINE A
biDTAPE MACHINE B
sNAME
sLETTER
sDESCRIPTION
503
PREVIEW.dbf
PREVIEW
wlDPREVIEW
wDURATION
sNAME
sDESCRIPTION
eLOCATION
PROGCAT.dbf
504
PROGRAM_
CATEGORY
wlDPROGRAM-
CATEGORY
sNAME
PRICECAT.dbf
505
PRICE_
CATEGORY
bIDPRICE-
CATEGORY
wPRICE
HEADEND.dbf
506
HEAD_END_DATA
wlDHEAD END
sNAME
stCONTACT
stMODEM
bTIME ZONE
bDDTDAYLIGHT SAVINGS TIME
518
EVENT.dbf
EVENT_LOG
FILENAME
stDATE
sFILENAME
boSTARCHIVED
BILLING.dbf
507
BILLING_
FILENAME
stDATE
sFILENAME
508
VIEWER.dbf
VIEWER_LOG
FILENAME
stDATE
sFILENAME
509
aDDDDD01.dbf
EVENT_LOG
wlDEVENT
eCODE
biDSOURCE
stDATE TIME
510
aDDDDD01.dbf
BILLING
dwIDSET TOP
wlDPROGRAM
stDATE TIME
511
aDDDDD01.dbf
VIEWER_LOG
dwIDSET TOP
wlDSERVICE
stDATE TIME
wDURATION
512
TAPE.dbf
TAPE_MACHINE
biDTAPE MACHINE
bCOMM ADDRESS
bABSWITCH ADDRESS
wlDSERVICE
bAB
519
TASK.dbf
TASK
wlDTASK
stSTART
stSTOP
wPERIOD
eTASK TYPE
wlDMESSAGE
513
MESSAGE.dbf
MESSAGE
wlDMESSAGE
sfHEADER
abDATA
514
CUSTDMER.dbf
CUSTDMER
dwIDCUSTDMER
sfPERSON
dwIDSET TOP
516
SETTOP.dbf
SET_TOP
dwIDSET TOP
wlDHEAD END
eTYPE
eVERSION
sSERIAL NUMBER
517
NATIONAL.dbf
NATIONAL_DATA
sNAME
stCONTACT
sMODEM-
PHONE NUMBER
bTIME ZONE
bDDTDAYLIGHT-
SAVINGS TIME
515

Fig. 10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AMPLIFICATION
294
296
MODULATION
292
MULTIPLEXING
290
COMPRESSION
288
CABLE FRANCHISE CONFIGURATION
328
COMPUTER ASSISTED PACKAGING (CAP)
250
280
EXTERNAL SOURCES
DIGITAL
ANALOG
282
CONVERT TO STANDARD DIGITAL FORMAT
284
STORED PROGRAMS
286

Fig. 11

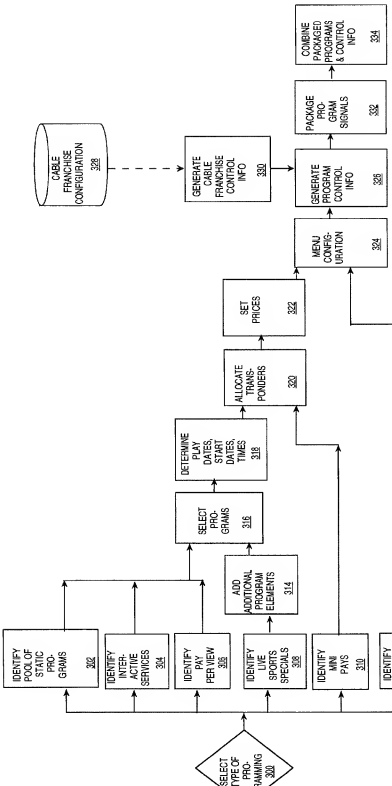

SELECT TYPE OF PROGRAMMING 302
260
IDENTIFY POOL OF STATIC PROGRAMS 302
IDENTIFY INTERACTIVE SERVICES 304
IDENTIFY PAY PER VIEW 306
IDENTIFY LIVE SPORTS EVENTS 308
IDENTIFY MINI PAYS 310
IDENTIFY DATA SERVICES 312
ADD ADDITIONAL PROGRAM ELEMENTS 314
SELECT PPV PROGRAMS 316
DETERMINE PLAY DATES, START DATES, TIMES 318
ALLOCATE TRANSPONDERS 320
SET PRICES 322
MENU CONFIGURATION 324
GENERATE PROGRAM CONTROL INFO 326
PACKAGE PROGRAM SIGNALS 332
COMBINE PACKAGED PROGRAMS & CONTROL INFO 334
CABLE FRANCHISE CONFIGURATION 328
GENERATE CABLE FRANCHISE CONTROL INFO 330

Fig. 12

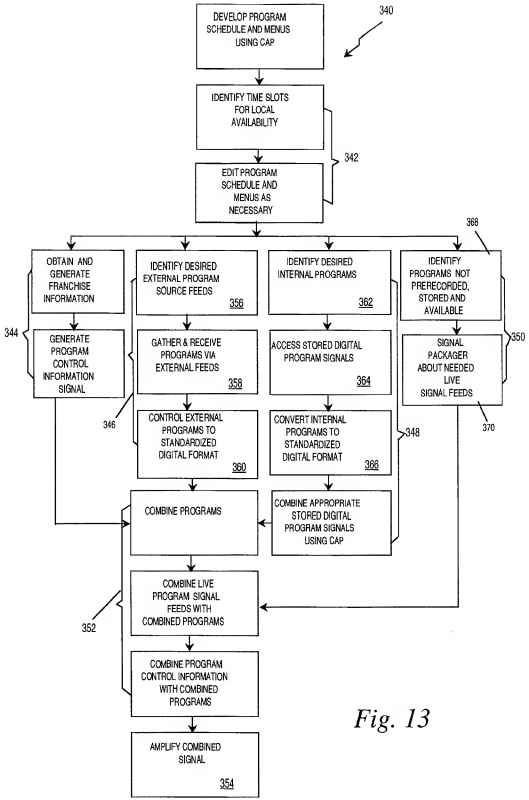

DEVELOP PROGRAM SCHEDULE AND MENUS USING CAP
340
IDENTIFY TIME SLOTS FOR LOCAL AVAILABILITY
342
EDIT PROGRAM SCHEDULE AND MENUS AS NECESSARY
368
OBTAIN AND GENERATE FRANCHISE INFORMATION
IDENTIFY DESIRED EXTERNAL PROGRAM SOURCE FEEDS 356
IDENTIFY DESIRED INTERNAL PROGRAMS 362
IDENTIFY PROGRAMS NOT PRERECORDED, STORED AND AVAILABLE
344
GENERATE PROGRAM CONTROL INFORMATION SIGNAL
GATHER & RECEIVE PROGRAMS VIA EXTERNAL FEEDS 358
ACCESS STORED DIGITAL PROGRAM SIGNALS 364
SIGNAL PACKAGER ABOUT NEEDED LIVE SIGNAL FEEDS
350
346
CONTROL EXTERNAL PROGRAMS TO STANDARDIZED DIGITAL FORMAT 360
CONVERT INTERNAL PROGRAMS TO STANDARDIZED DIGITAL FORMAT 366
348
370
COMBINE PROGRAMS
COMBINE APPROPRIATE STORED DIGITAL PROGRAM SIGNALS USING CAP
COMBINE LIVE PROGRAM SIGNAL FEEDS WITH COMBINED PROGRAMS
352
COMBINE PROGRAM CONTROL INFORMATION WITH COMBINED PROGRAMS
AMPLIFY COMBINED SIGNAL 354

Fig. 13

Fig. 14

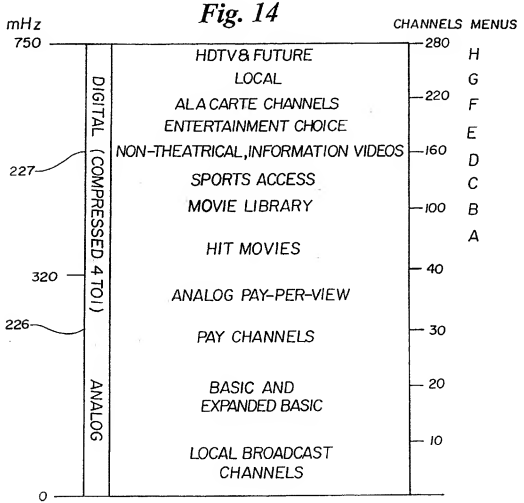

mHz
750
227
320
226
0
DIGITAL (COMPRESSED 4 TO 1)
ANALOG
HDTV & FUTURE
LOCAL
A LA CARTE CHANNELS
ENTERTAINMENT CHOICE
NON-THEATRICAL, INFORMATION VIDEOS
SPORTS ACCESS
MOVIE LIBRARY
HIT MOVIES
ANALOG PAY-PER-VIEW
PAY CHANNELS
BASIC AND EXPANDED BASIC
LOCAL BROADCAST CHANNELS
CHANNELS
280
220
160
100
40
30
20
10
MENUS
H
G
F
E
D
C
B
A

Fig. 15

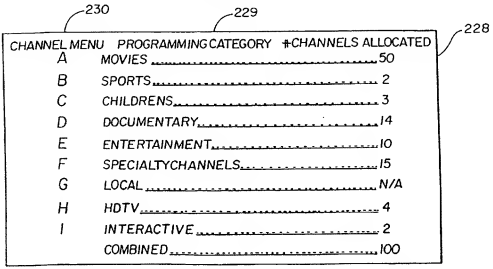

230
229
228
CHANNEL MENU
PROGRAMMING CATEGORY
#CHANNELS ALLOCATED
A MOVIES 50
B SPORTS 2
C CHILDRENS 3
D DOCUMENTARY 14
E ENTERTAINMENT 10
F SPECIALTY CHANNELS 15
G LOCAL N/A
H HDTV 4
I INTERACTIVE 2
COMBINED 100

Fig. 16

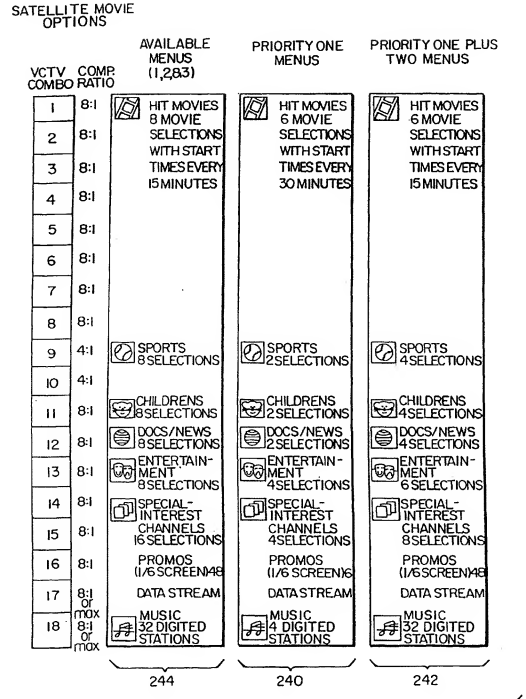

SATELLITE MOVIE OPTIONS
VCTV COMBO
COMP. RATIO
AVAILABLE MENUS (1,2&3)
PRIORITY ONE MENUS
PRIORITY ONE PLUS TWO MENUS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
8:1
8:1
8:1
8:1
8:1
8:1
8:1
8:1
4:1
4:1
8:1
8:1
8:1
8:1
8:1
8:1
8:1 or max
8:1 or max
HIT MOVIES 8 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
HIT MOVIES 6 MOVIE SELECTIONS WITH START TIMES EVERY 30 MINUTES
HIT MOVIES 6 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
SPORTS 8 SELECTIONS
SPORTS 2 SELECTIONS
SPORTS 4 SELECTIONS
CHILDRENS 8 SELECTIONS
CHILDRENS 2 SELECTIONS
CHILDRENS 4 SELECTIONS
DOCS/NEWS 8 SELECTIONS
DOCS/NEWS 2 SELECTIONS
DOCS/NEWS 4 SELECTIONS
ENTERTAIN-MENT 8 SELECTIONS
ENTERTAIN-MENT 4 SELECTIONS
ENTERTAIN-MENT 6 SELECTIONS
SPECIAL-INTEREST CHANNELS 16 SELECTIONS
SPECIAL-INTEREST CHANNELS 4 SELECTIONS
SPECIAL-INTEREST CHANNELS 8 SELECTIONS
PROMOS (1/6 SCREEN)48
PROMOS (1/6 SCREEN)6
PROMOS (1/6 SCREEN)48
DATA STREAM
DATA STREAM
DATA STREAM
MUSIC 32 DIGITED STATIONS
MUSIC 4 DIGITED STATIONS
MUSIC 32 DIGITED STATIONS
244
240
242

Fig. 17

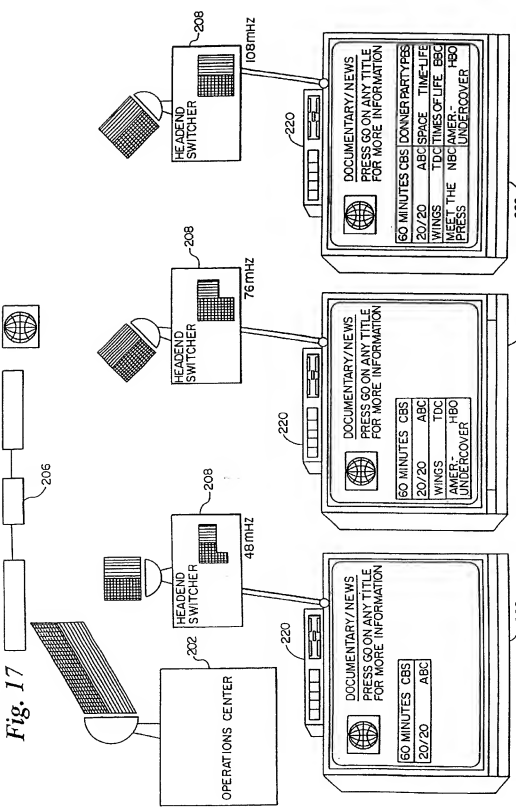

OPERATIONS CENTER
202
206
HEADEND SWITCHER
208
48mHz
76mHz
108mHz
220
222
DOCUMENTARY/NEWS
PRESS GO ON ANY TITLE FOR MORE INFORMATION
60 MINUTES CBS
20/20 ABC
WINGS TDC
AMER.- HBO
UNDERCOVER
DONNER PARTY PBS
SPACE TIME-LIFE
TIMES OF LIFE BBC
MEET THE PRESS NBC

Fig. 18

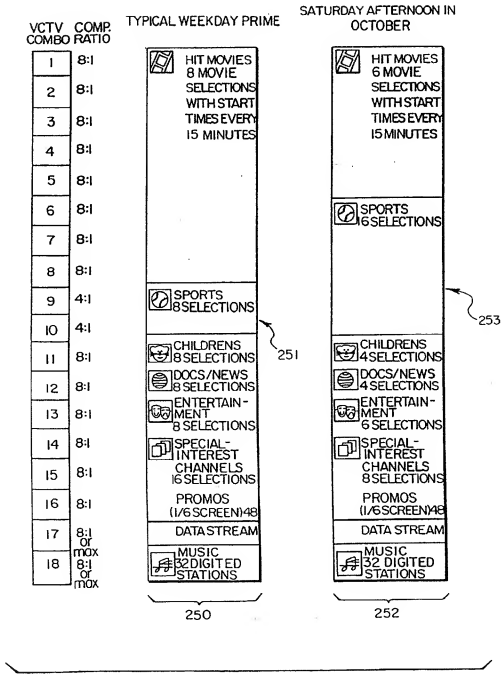

VCTV COMBO
COMP. RATIO
1 8:1
2 8:1
3 8:1
4 8:1
5 8:1
6 8:1
7 8:1
8 8:1
9 4:1
10 4:1
11 8:1
12 8:1
13 8:1
14 8:1
15 8:1
16 8:1
17 8:1 or max
18 8:1 or max
TYPICAL WEEKDAY PRIME
HIT MOVIES 8 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
SPORTS 8 SELECTIONS
CHILDRENS 8 SELECTIONS
DOCS/NEWS 8 SELECTIONS
ENTERTAIN-MENT 8 SELECTIONS
SPECIAL-INTEREST CHANNELS 16 SELECTIONS
PROMOS (1/6 SCREEN)48
DATA STREAM
MUSIC 32 DIGITED STATIONS
251
250
SATURDAY AFTERNOON IN OCTOBER
HIT MOVIES 6 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
SPORTS 6 SELECTIONS
CHILDRENS 4 SELECTIONS
DOCS/NEWS 4 SELECTIONS
ENTERTAIN-MENT 6 SELECTIONS
SPECIAL-INTEREST CHANNELS 8 SELECTIONS
PROMOS (1/6 SCREEN)48
DATA STREAM
MUSIC 32 DIGITED STATIONS
253
252

Fig. 19

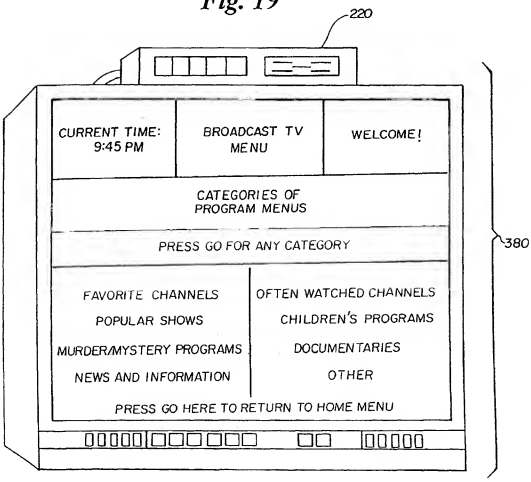

220
CURRENT TIME: 9:45 PM
BROADCAST TV MENU
WELCOME!
CATEGORIES OF PROGRAM MENUS
PRESS GO FOR ANY CATEGORY
380
FAVORITE CHANNELS
POPULAR SHOWS
MURDER/MYSTERY PROGRAMS
NEWS AND INFORMATION
OFTEN WATCHED CHANNELS
CHILDREN'S PROGRAMS
DOCUMENTARIES
OTHER
PRESS GO HERE TO RETURN TO HOME MENU

Fig. 20

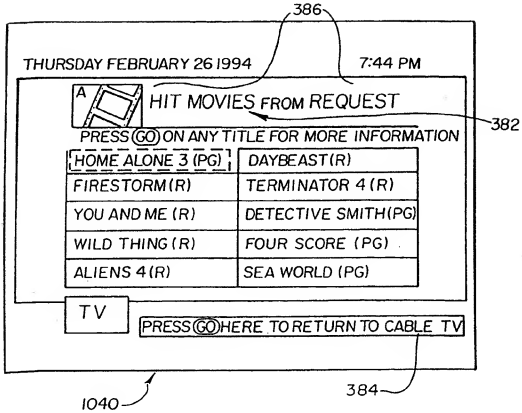
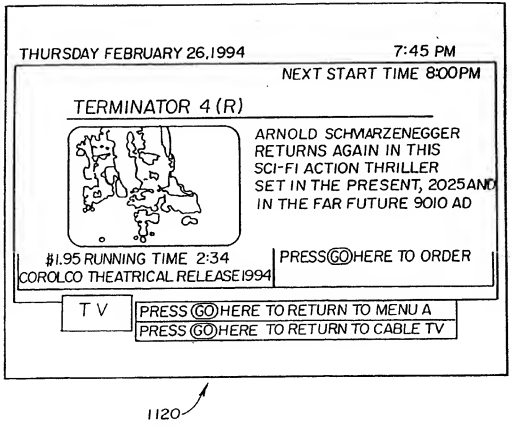

386
THURSDAY FEBRUARY 26 1994
7:44 PM
A
HIT MOVIES FROM REQUEST
382
PRESS GO ON ANY TITLE FOR MORE INFORMATION
HOME ALONE 3 (PG)
DAYBEAST(R)
FIRESTORM(R)
TERMINATOR 4 (R)
YOU AND ME (R)
DETECTIVE SMITH(PG)
WILD THING (R)
FOUR SCORE (PG)
ALIENS 4(R)
SEA WORLD (PG)
TV
PRESS GO HERE TO RETURN TO CABLE TV
1040
384

Fig. 21


THURSDAY FEBRUARY 26,1994
7:45 PM
NEXT START TIME 8:00PM
TERMINATOR 4 (R)
ARNOLD SCHWARZENEGGER RETURNS AGAIN IN THIS SCI-FI ACTION THRILLER SET IN THE PRESENT, 2025 AND IN THE FAR FUTURE 9010 AD
#1.95 RUNNING TIME 2:34
COROLCO THEATRICAL RELEASE 1994
PRESS GO HERE TO ORDER
T V
PRESS GO HERE TO RETURN TO MENU A
PRESS GO HERE TO RETURN TO CABLE TV
1120

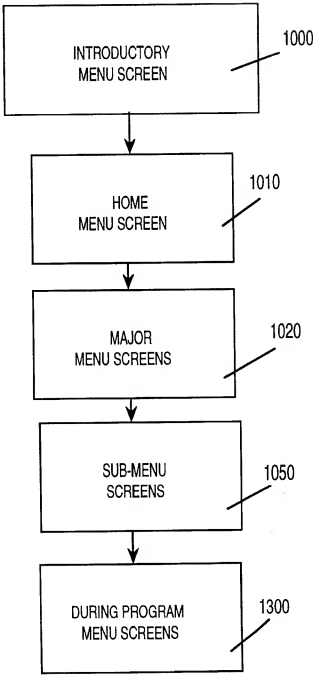

INTRODUCTORY MENU SCREEN
1000
HOME MENU SCREEN
1010
MAJOR MENU SCREENS
1020
SUB-MENU SCREENS
1050
DURING PROGRAM MENU SCREENS
1300

Fig. 22

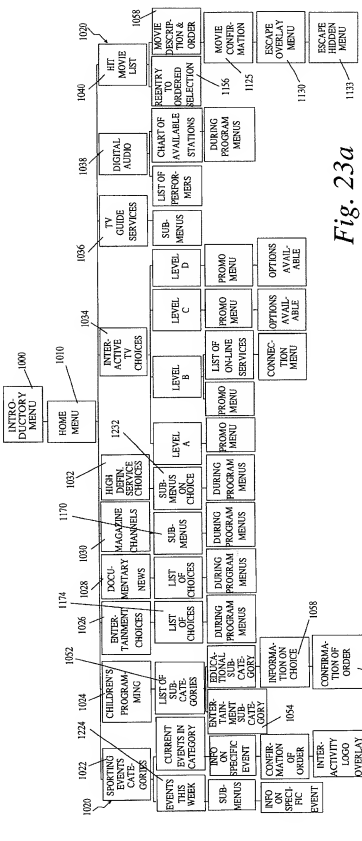

INTRO-DUCTORY MENU
1000
HOME MENU
1010
INTER-ACTIVE TV CHOICES
1034
LEVEL B
LEVEL C
LEVEL D
SUB-MENUS
TV GUIDE SERVICES
1036
DIGITAL AUDIO
1038
HIT MOVIE LIST
1040
1020
1058
MOVIE ORDER-ING INFORMA-TION & ORDER
1058
REENTRY TO PREVIOUSLY ORDERED SELECTION
1156
MOVIE CONFIR-MATION
1125
ESCAPE, GOES TO A MENU
1130
ESCAPE HIDDEN MENU
1133
LIST OF PERFOR-MERS
CHART OF AVAILABLE STATIONS
DURING PROGRAM-MING MENUS
LIST OF ON-LINE SERVICES
CONNEC-TION MENU
OPTIONS AVAIL-ABLE
PROMO MENU
LEVEL A
1232
HIGH DEFIN-ITION SERVICE CHOICES
SUB-MENUS OR CHOICE
1170
1032
MAGA-ZINE CHANNELS
SUB-MENUS
DOCU-MENTARY NEWS
LIST OF CHOICES
1030
1174
1028
ENTER-TAINMENT CHOICES
1026
CHILDREN'S PROGRAM-MING
1024
1052
EDUCA-TIONAL SUB-CATE-GORY
1054
INFORMA-TION ON CHOICE
1058
CONFIRMA-TION OF ORDER
1060
LIST OF SUB-CATE-GORIES
DURING PROGRAM MENUS
1020
SPORTING EVENTS CATE-GORIES
1022
1224
CURRENT EVENTS IN CATEGORY
INFO ON SPECIFIC EVENT
CONFIR-MATION OF ORDER
INTER-ACTIVITY LOGO OVERLAY
HIDDEN MENUS
EVENTS THIS WEEK
SUB-MENUS
INFO ON SPECI-FIC EVENT

Fig. 23a

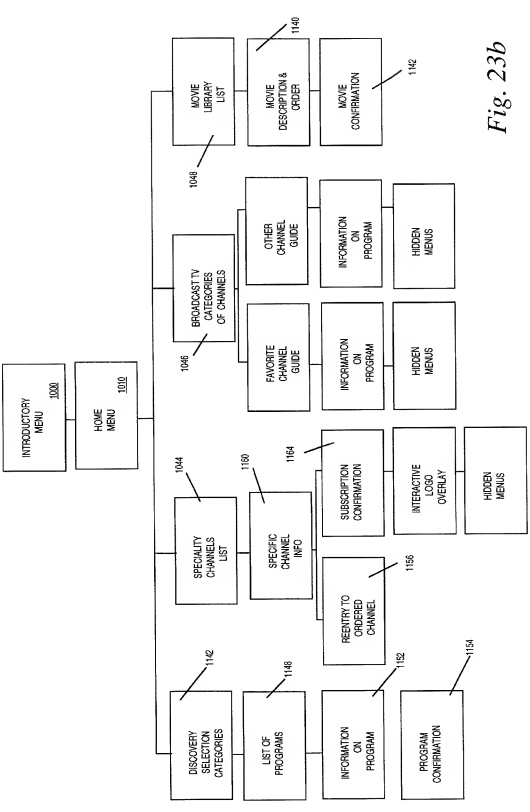

INTRODUCTORY MENU 1000
HOME MENU 1010
DISCOVERY SELECTION CATEGORIES 1142
LIST OF PROGRAMS 1148
INFORMATION ON PROGRAM 1152
PROGRAM CONFIRMATION 1154
SPECIALITY CHANNELS LIST 1044
SPECIFIC CHANNEL INFO 1160
REENTRY TO ORDERED CHANNEL 1156
SUBSCRIPTION CONFIRMATION 1164
INTERACTIVE LOGO OVERLAY
HIDDEN MENUS
BROADCAST TV CATEGORIES OF CHANNELS 1046
FAVORITE CHANNEL GUIDE
INFORMATION ON PROGRAM
HIDDEN MENUS
OTHER CHANNEL GUIDE
INFORMATION ON PROGRAM
HIDDEN MENUS
MOVIE LIBRARY LIST 1048
MOVIE DESCRIPTION & ORDER 1140
MOVIE CONFIRMATION 1142

Fig. 23b

Fig. 24a

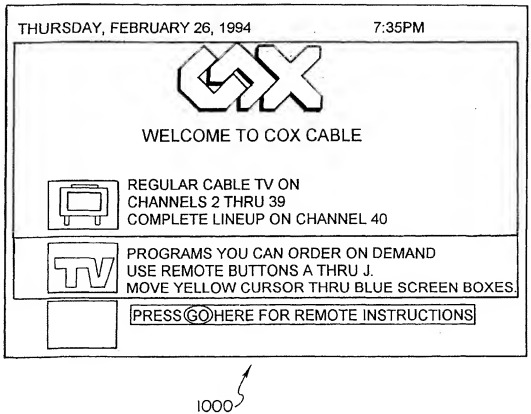

THURSDAY, FEBRUARY 26, 1994
7:35PM
WELCOME TO COX CABLE
REGULAR CABLE TV ON
CHANNELS 2 THRU 39
COMPLETE LINEUP ON CHANNEL 40
PROGRAMS YOU CAN ORDER ON DEMAND
USE REMOTE BUTTONS A THRU J.
MOVE YELLOW CURSOR THRU BLUE SCREEN BOXES.
PRESS GO HERE FOR REMOTE INSTRUCTIONS
1000

Fig. 24b

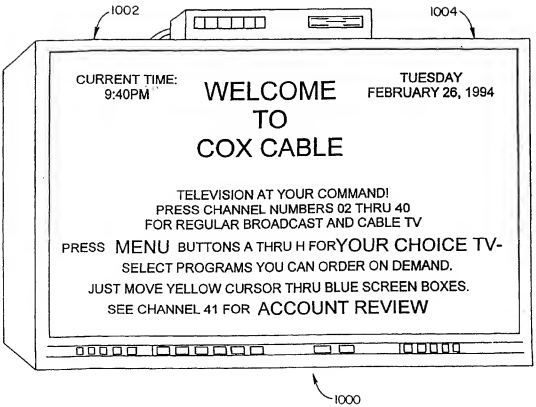

1002
1004
CURRENT TIME:
9:40PM
WELCOME
TO
COX CABLE
TUESDAY
FEBRUARY 26, 1994
TELEVISION AT YOUR COMMAND!
PRESS CHANNEL NUMBERS 02 THRU 40
FOR REGULAR BROADCAST AND CABLE TV
PRESS MENU BUTTONS A THRU H FORYOUR CHOICE TV-
SELECT PROGRAMS YOU CAN ORDER ON DEMAND.
JUST MOVE YELLOW CURSOR THRU BLUE SCREEN BOXES.
SEE CHANNEL 41 FOR ACCOUNT REVIEW
1000

Fig. 25a

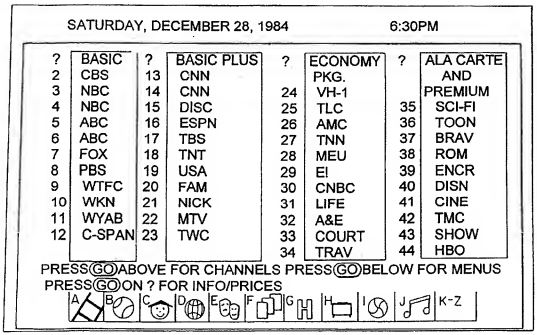

SATURDAY, DECEMBER 28, 1984
6:30PM
? BASIC
2 CBS
3 NBC
4 NBC
5 ABC
6 ABC
7 FOX
8 PBS
9 WTFC
10 WKN
11 WYAB
12 C-SPAN
? BASIC PLUS
13 CNN
14 CNN
15 DISC
16 ESPN
17 TBS
18 TNT
19 USA
20 FAM
21 NICK
22 MTV
23 TWC
? ECONOMY PKG.
24 VH-1
25 TLC
26 AMC
27 TNN
28 MEU
29 EI
30 CNBC
31 LIFE
32 A&E
33 COURT
34 TRAV
? ALA CARTE AND PREMIUM
35 SCI-FI
36 TOON
37 BRAV
38 ROM
39 ENCR
40 DISN
41 CINE
42 TMC
43 SHOW
44 HBO
PRESS GO ABOVE FOR CHANNELS PRESS GO BELOW FOR MENUS
PRESS GO ON ? FOR INFO/PRICES
A B C D E F G H I J K-Z
1010

Fig. 25b

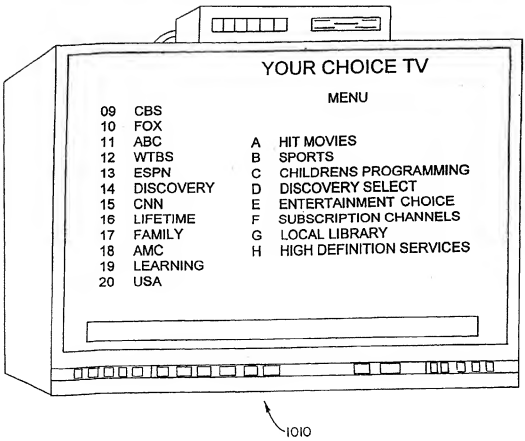

YOUR CHOICE TV
MENU
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
A HIT MOVIES
B SPORTS
C CHILDRENS PROGRAMMING
D DISCOVERY SELECT
E ENTERTAINMENT CHOICE
F SUBSCRIPTION CHANNELS
G LOCAL LIBRARY
H HIGH DEFINITION SERVICES
1010

Fig. 25c

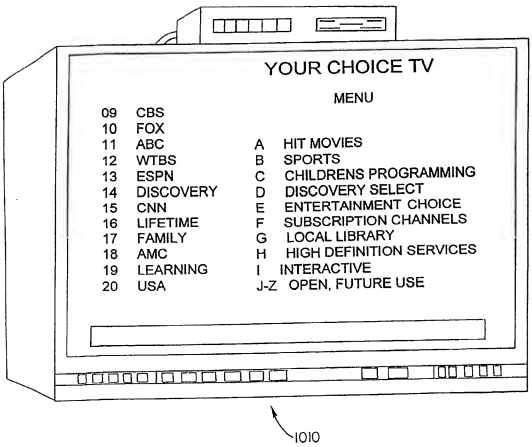

YOUR CHOICE TV
MENU
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
A HIT MOVIES
B SPORTS
C CHILDRENS PROGRAMMING
D DISCOVERY SELECT
E ENTERTAINMENT CHOICE
F SUBSCRIPTION CHANNELS
G LOCAL LIBRARY
H HIGH DEFINITION SERVICES
I INTERACTIVE
J-Z OPEN, FUTURE USE
1010

Fig. 25d

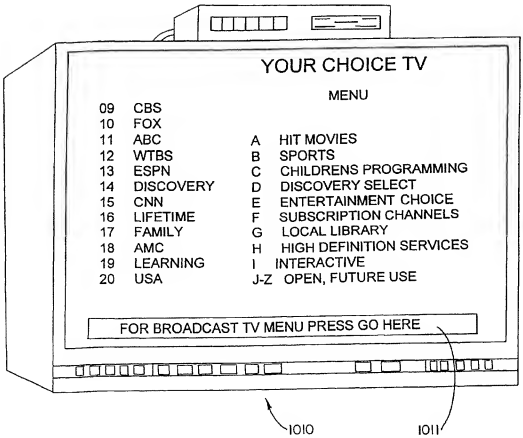

YOUR CHOICE TV
MENU
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
A HIT MOVIES
B SPORTS
C CHILDRENS PROGRAMMING
D DISCOVERY SELECT
E ENTERTAINMENT CHOICE
F SUBSCRIPTION CHANNELS
G LOCAL LIBRARY
H HIGH DEFINITION SERVICES
I INTERACTIVE
J-Z OPEN, FUTURE USE
FOR BROADCAST TV MENU PRESS GO HERE
1010
1011

Fig. 26

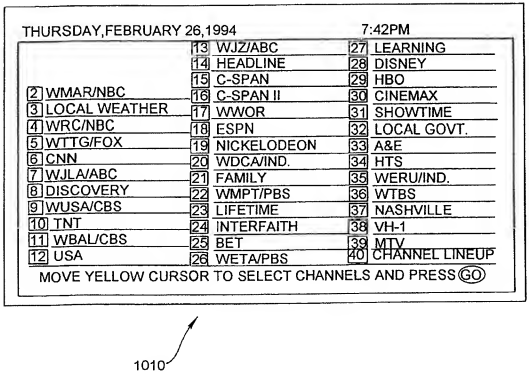

THURSDAY,FEBRUARY 26,1994
7:42PM
2 WMAR/NBC
3 LOCAL WEATHER
4 WRC/NBC
5 WTTG/FOX
6 CNN
7 WJLA/ABC
8 DISCOVERY
9 WUSA/CBS
10 TNT
11 WBAL/CBS
12 USA
13 WJZ/ABC
14 HEADLINE
15 C-SPAN
16 C-SPAN II
17 WWOR
18 ESPN
19 NICKELODEON
20 WDCA/IND.
21 FAMILY
22 WMPT/PBS
23 LIFETIME
24 INTERFAITH
25 BET
26 WETA/PBS
27 LEARNING
28 DISNEY
29 HBO
30 CINEMAX
31 SHOWTIME
32 LOCAL GOVT.
33 A&E
34 HTS
35 WERU/IND.
36 WTBS
37 NASHVILLE
38 VH-1
39 MTV
40 CHANNEL LINEUP
MOVE YELLOW CURSOR TO SELECT CHANNELS AND PRESS GO
1010

Fig. 27a

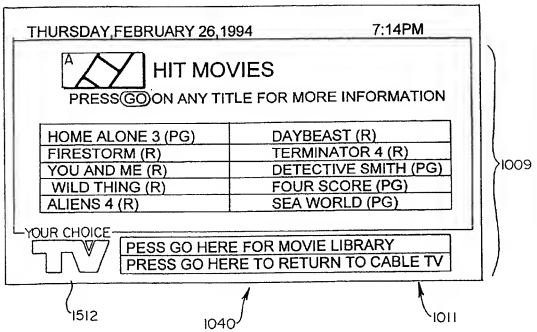

THURSDAY,FEBRUARY 26,1994
7:14PM
HIT MOVIES
PRESS GO ON ANY TITLE FOR MORE INFORMATION
HOME ALONE 3 (PG)
DAYBEAST (R)
FIRESTORM (R)
TERMINATOR 4 (R)
YOU AND ME (R)
DETECTIVE SMITH (PG)
WILD THING (R)
FOUR SCORE (PG)
ALIENS 4 (R)
SEA WORLD (PG)
YOUR CHOICE
PESS GO HERE FOR MOVIE LIBRARY
PRESS GO HERE TO RETURN TO CABLE TV
1009
1512
1040
1011

Fig. 27b

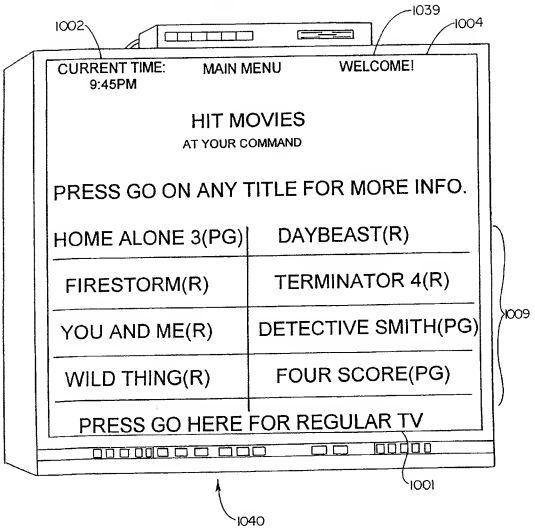

1002
1039
1004
CURRENT TIME: 9:45PM
MAIN MENU
WELCOME!
HIT MOVIES
AT YOUR COMMAND
PRESS GO ON ANY TITLE FOR MORE INFO.
HOME ALONE 3(PG)
DAYBEAST(R)
FIRESTORM(R)
TERMINATOR 4(R)
YOU AND ME(R)
DETECTIVE SMITH(PG)
WILD THING(R)
FOUR SCORE(PG)
1009
PRESS GO HERE FOR REGULAR TV
1001
1040

Fig. 27c

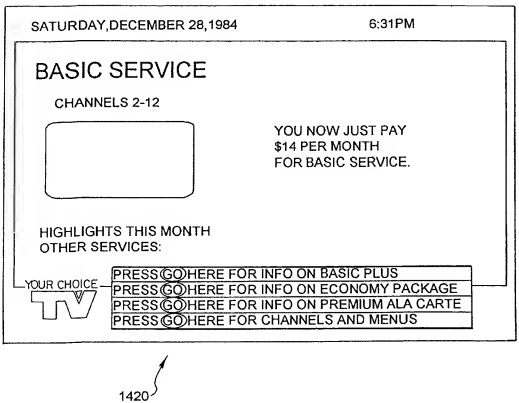

SATURDAY,DECEMBER 28,1984
6:31PM
BASIC SERVICE
CHANNELS 2-12
YOU NOW JUST PAY
$14 PER MONTH
FOR BASIC SERVICE.
HIGHLIGHTS THIS MONTH
OTHER SERVICES:
YOUR CHOICE
PRESS GO HERE FOR INFO ON BASIC PLUS
PRESS GO HERE FOR INFO ON ECONOMY PACKAGE
PRESS GO HERE FOR INFO ON PREMIUM ALA CARTE
PRESS GO HERE FOR CHANNELS AND MENUS
1420

Fig. 27d

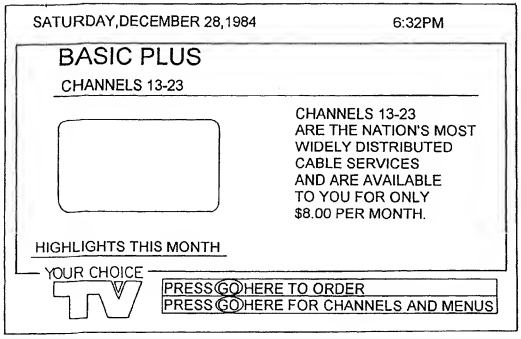

SATURDAY,DECEMBER 28,1984
6:32PM
BASIC PLUS
CHANNELS 13-23
CHANNELS 13-23
ARE THE NATION'S MOST
WIDELY DISTRIBUTED
CABLE SERVICES
AND ARE AVAILABLE
TO YOU FOR ONLY
$8.00 PER MONTH.
HIGHLIGHTS THIS MONTH
YOUR CHOICE
TV
PRESS GO HERE TO ORDER
PRESS GO HERE FOR CHANNELS AND MENUS
1422

Fig. 27e

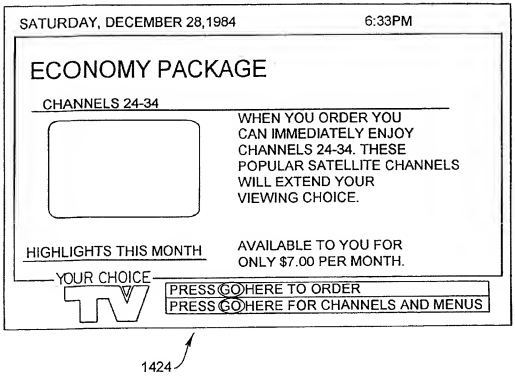

SATURDAY, DECEMBER 28,1984
6:33PM
ECONOMY PACKAGE
CHANNELS 24-34
WHEN YOU ORDER YOU CAN IMMEDIATELY ENJOY CHANNELS 24-34. THESE POPULAR SATELLITE CHANNELS WILL EXTEND YOUR VIEWING CHOICE.
HIGHLIGHTS THIS MONTH
AVAILABLE TO YOU FOR ONLY $7.00 PER MONTH.
YOUR CHOICE
TV
PRESS GO HERE TO ORDER
PRESS GO HERE FOR CHANNELS AND MENUS
1424

Fig. 27f

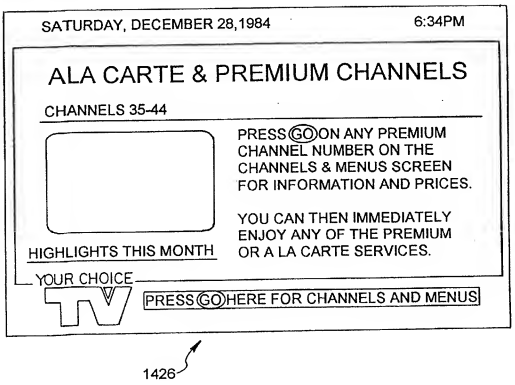

SATURDAY, DECEMBER 28,1984
6:34PM
ALA CARTE & PREMIUM CHANNELS
CHANNELS 35-44
PRESS GO ON ANY PREMIUM CHANNEL NUMBER ON THE CHANNELS & MENUS SCREEN FOR INFORMATION AND PRICES.
YOU CAN THEN IMMEDIATELY ENJOY ANY OF THE PREMIUM OR A LA CARTE SERVICES.
HIGHLIGHTS THIS MONTH
YOUR CHOICE
TV
PRESS GO HERE FOR CHANNELS AND MENUS
1426

Fig. 27g

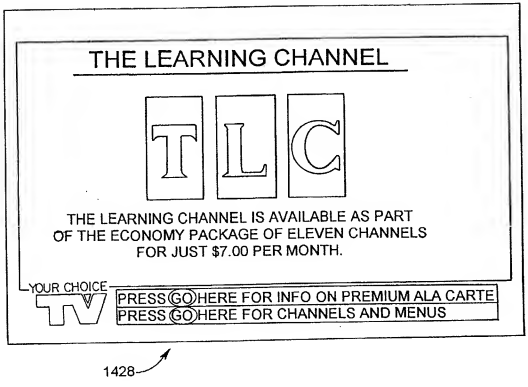

THE LEARNING CHANNEL
T L C
THE LEARNING CHANNEL IS AVAILABLE AS PART
OF THE ECONOMY PACKAGE OF ELEVEN CHANNELS
FOR JUST $7.00 PER MONTH.
YOUR CHOICE TV
PRESS GO HERE FOR INFO ON PREMIUM ALA CARTE
PRESS GO HERE FOR CHANNELS AND MENUS
1428

Fig. 28a

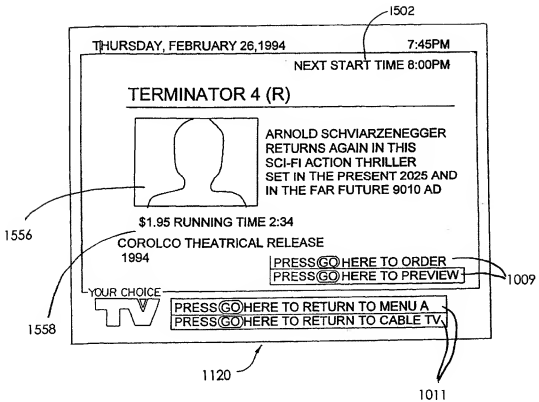

1502
THURSDAY, FEBRUARY 26,1994
7:45PM
NEXT START TIME 8:00PM
TERMINATOR 4 (R)
ARNOLD SCHVIARZENEGGER RETURNS AGAIN IN THIS SCI-FI ACTION THRILLER SET IN THE PRESENT 2025 AND IN THE FAR FUTURE 9010 AD
$1.95 RUNNING TIME 2:34
COROLCO THEATRICAL RELEASE 1994
PRESS GO HERE TO ORDER
PRESS GO HERE TO PREVIEW
1009
YOUR CHOICE
TV
PRESS GO HERE TO RETURN TO MENU A
PRESS GO HERE TO RETURN TO CABLE TV
1556
1558
1120
1011

Fig. 28b

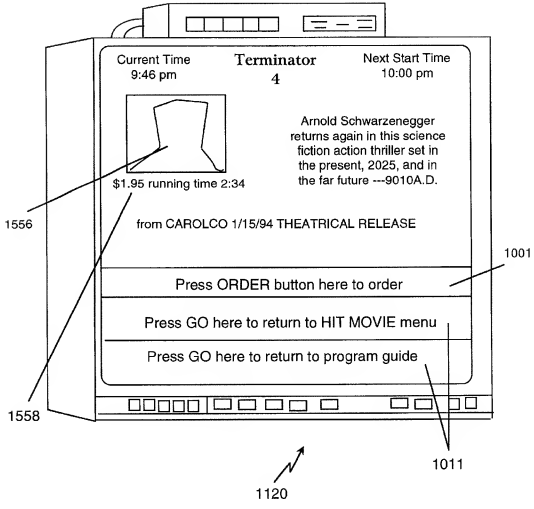

Current Time
9:46 pm
Terminator
4
Next Start Time
10:00 pm
Arnold Schwarzenegger returns again in this science fiction action thriller set in the present, 2025, and in the far future ---9010A.D.
$1.95 running time 2:34
1556
from CAROLCO 1/15/94 THEATRICAL RELEASE
1001
Press ORDER button here to order
Press GO here to return to HIT MOVIE menu
Press GO here to return to program guide
1558
1011
1120

Fig. 29a

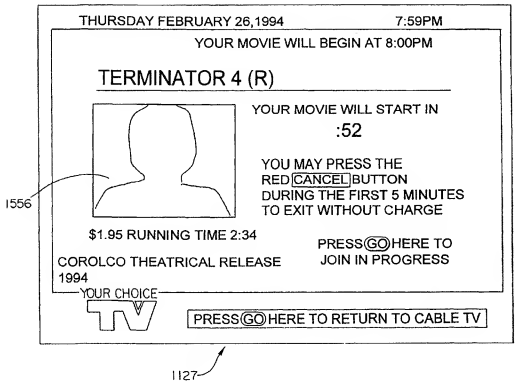

THURSDAY FEBRUARY 26,1994
7:59PM
YOUR MOVIE WILL BEGIN AT 8:00PM
TERMINATOR 4 (R)
YOUR MOVIE WILL START IN
:52
YOU MAY PRESS THE
RED CANCEL BUTTON
DURING THE FIRST 5 MINUTES
TO EXIT WITHOUT CHARGE
1556
$1.95 RUNNING TIME 2:34
PRESS GO HERE TO
JOIN IN PROGRESS
COROLCO THEATRICAL RELEASE
1994
YOUR CHOICE
TV
PRESS GO HERE TO RETURN TO CABLE TV
1127

Fig. 29b

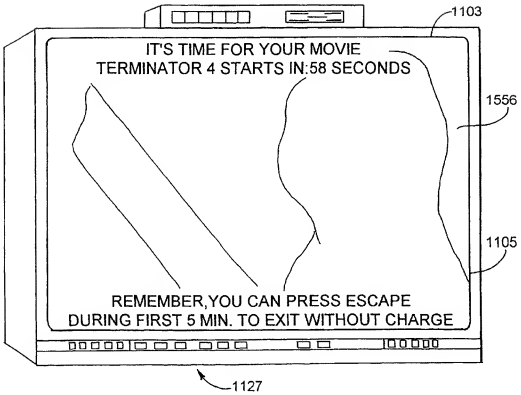

1103
IT'S TIME FOR YOUR MOVIE
TERMINATOR 4 STARTS IN:58 SECONDS
1556
1105
REMEMBER,YOU CAN PRESS ESCAPE
DURING FIRST 5 MIN. TO EXIT WITHOUT CHARGE
1127

Fig. 30a

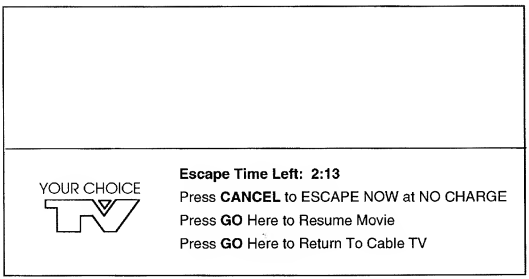

YOUR CHOICE TV
Escape Time Left: 2:13
Press CANCEL to ESCAPE NOW at NO CHARGE
Press GO Here to Resume Movie
Press GO Here to Return To Cable TV
1130

Fig. 30b

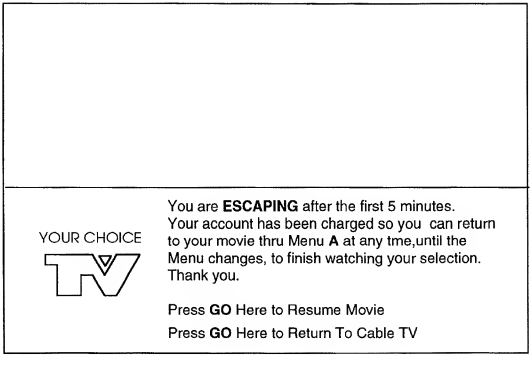

YOUR CHOICE
You are **ESCAPING** after the first 5 minutes.
Your account has been charged so you can return to your movie thru Menu **A** at any tme,until the Menu changes, to finish watching your selection.
Thank you.
Press **GO** Here to Resume Movie
Press **GO** Here to Return To Cable TV
1133

Fig. 30c

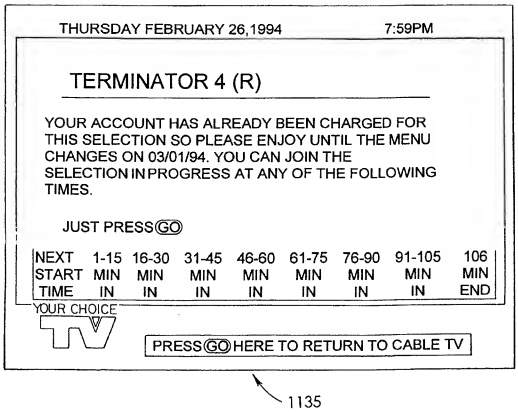

THURSDAY FEBRUARY 26,1994
7:59PM
TERMINATOR 4 (R)
YOUR ACCOUNT HAS ALREADY BEEN CHARGED FOR THIS SELECTION SO PLEASE ENJOY UNTIL THE MENU CHANGES ON 03/01/94. YOU CAN JOIN THE SELECTION IN PROGRESS AT ANY OF THE FOLLOWING TIMES.
JUST PRESS GO
NEXT START TIME
1-15 MIN IN
16-30 MIN IN
31-45 MIN IN
46-60 MIN IN
61-75 MIN IN
76-90 MIN IN
91-105 MIN IN
106 MIN END
YOUR CHOICE TV
PRESS GO HERE TO RETURN TO CABLE TV
1135

Fig. 31a

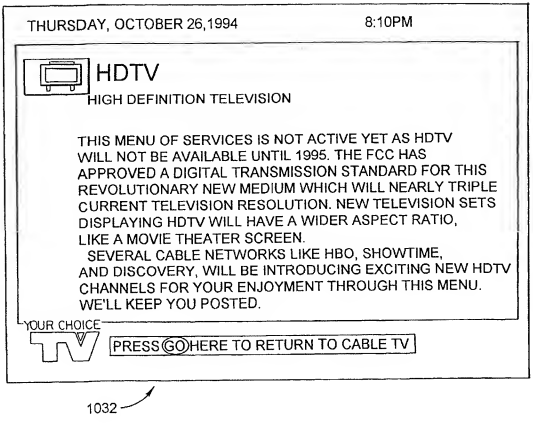

THURSDAY, OCTOBER 26,1994
8:10PM
HDTV
HIGH DEFINITION TELEVISION
THIS MENU OF SERVICES IS NOT ACTIVE YET AS HDTV WILL NOT BE AVAILABLE UNTIL 1995. THE FCC HAS APPROVED A DIGITAL TRANSMISSION STANDARD FOR THIS REVOLUTIONARY NEW MEDIUM WHICH WILL NEARLY TRIPLE CURRENT TELEVISION RESOLUTION. NEW TELEVISION SETS DISPLAYING HDTV WILL HAVE A WIDER ASPECT RATIO, LIKE A MOVIE THEATER SCREEN.
SEVERAL CABLE NETWORKS LIKE HBO, SHOWTIME, AND DISCOVERY, WILL BE INTRODUCING EXCITING NEW HDTV CHANNELS FOR YOUR ENJOYMENT THROUGH THIS MENU. WE'LL KEEP YOU POSTED.
YOUR CHOICE
PRESS GO HERE TO RETURN TO CABLE TV
1032

Fig. 31b

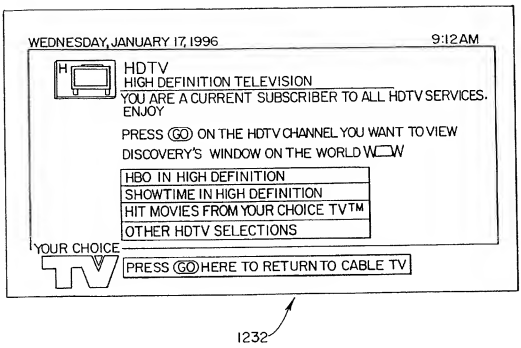

WEDNESDAY, JANUARY 17, 1996
9:12 AM
HDTV
HIGH DEFINITION TELEVISION
YOU ARE A CURRENT SUBSCRIBER TO ALL HDTV SERVICES. ENJOY
PRESS (GO) ON THE HDTV CHANNEL YOU WANT TO VIEW
DISCOVERY'S WINDOW ON THE WORLD WOW
HBO IN HIGH DEFINITION
SHOWTIME IN HIGH DEFINITION
HIT MOVIES FROM YOUR CHOICE TV™
OTHER HDTV SELECTIONS
YOUR CHOICE
PRESS (GO) HERE TO RETURN TO CABLE TV
1232

Fig. 32a

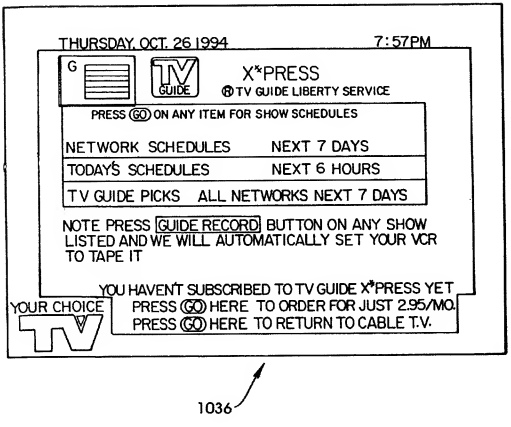
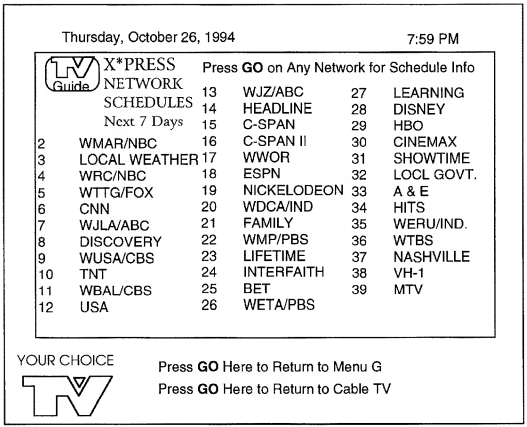
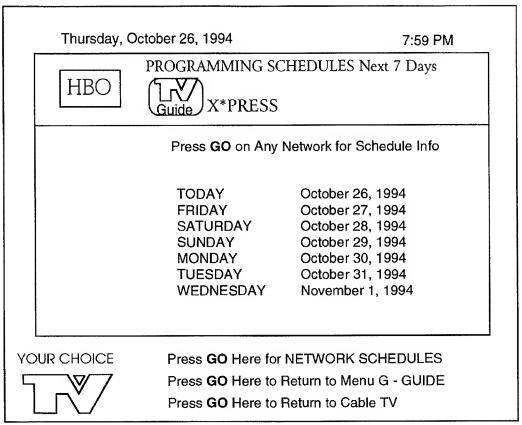

THURSDAY, OCT. 26 1994
7:57PM
G
TV GUIDE
X*PRESS
® TV GUIDE LIBERTY SERVICE
PRESS GO ON ANY ITEM FOR SHOW SCHEDULES
NETWORK SCHEDULES NEXT 7 DAYS
TODAY'S SCHEDULES NEXT 6 HOURS
TV GUIDE PICKS ALL NETWORKS NEXT 7 DAYS
NOTE PRESS GUIDE RECORD BUTTON ON ANY SHOW LISTED AND WE WILL AUTOMATICALLY SET YOUR VCR TO TAPE IT
YOU HAVEN'T SUBSCRIBED TO TV GUIDE X*PRESS YET
YOUR CHOICE
PRESS GO HERE TO ORDER FOR JUST 2.95/MO.
PRESS GO HERE TO RETURN TO CABLE T.V.
1036

Fig. 32b


Thursday, October 26, 1994
7:59 PM
TV Guide
X*PRESS NETWORK SCHEDULES
Next 7 Days
Press GO on Any Network for Schedule Info
2 WMAR/NBC
3 LOCAL WEATHER
4 WRC/NBC
5 WTTG/FOX
6 CNN
7 WJLA/ABC
8 DISCOVERY
9 WUSA/CBS
10 TNT
11 WBAL/CBS
12 USA
13 WJZ/ABC
14 HEADLINE
15 C-SPAN
16 C-SPAN II
17 WWOR
18 ESPN
19 NICKELODEON
20 WDCA/IND
21 FAMILY
22 WMP/PBS
23 LIFETIME
24 INTERFAITH
25 BET
26 WETA/PBS
27 LEARNING
28 DISNEY
29 HBO
30 CINEMAX
31 SHOWTIME
32 LOCL GOVT.
33 A & E
34 HITS
35 WERU/IND.
36 WTBS
37 NASHVILLE
38 VH-1
39 MTV
YOUR CHOICE
Press GO Here to Return to Menu G
Press GO Here to Return to Cable TV

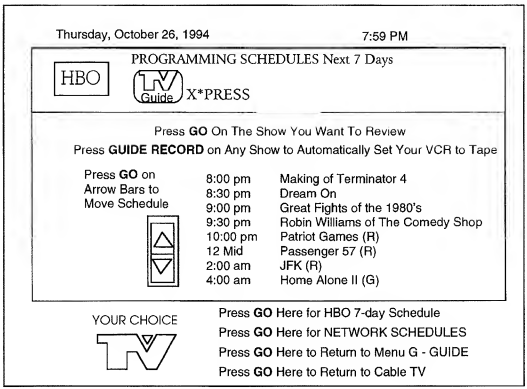
1236

Fig. 32c


Thursday, October 26, 1994
7:59 PM
PROGRAMMING SCHEDULES Next 7 Days
HBO
TV Guide X*PRESS
Press GO on Any Network for Schedule Info
TODAY October 26, 1994
FRIDAY October 27, 1994
SATURDAY October 28, 1994
SUNDAY October 29, 1994
MONDAY October 30, 1994
TUESDAY October 31, 1994
WEDNESDAY November 1, 1994
YOUR CHOICE
Press GO Here for NETWORK SCHEDULES
Press GO Here to Return to Menu G - GUIDE
Press GO Here to Return to Cable TV

1238

Fig. 32d


Thursday, October 26, 1994
7:59 PM
PROGRAMMING SCHEDULES Next 7 Days
HBO
TV Guide
X*PRESS
Press GO On The Show You Want To Review
Press GUIDE RECORD on Any Show to Automatically Set Your VCR to Tape
Press GO on Arrow Bars to Move Schedule
8:00 pm Making of Terminator 4
8:30 pm Dream On
9:00 pm Great Fights of the 1980's
9:30 pm Robin Williams of The Comedy Shop
10:00 pm Patriot Games (R)
12 Mid Passenger 57 (R)
2:00 am JFK (R)
4:00 am Home Alone II (G)
YOUR CHOICE
Press GO Here for HBO 7-day Schedule
Press GO Here for NETWORK SCHEDULES
Press GO Here to Return to Menu G - GUIDE
Press GO Here to Return to Cable TV

1242

Fig. 32e

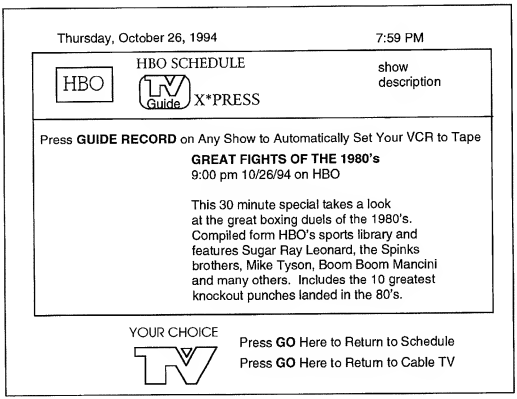

Thursday, October 26, 1994
7:59 PM
HBO
HBO SCHEDULE
TV Guide X*PRESS
show description
Press GUIDE RECORD on Any Show to Automatically Set Your VCR to Tape
GREAT FIGHTS OF THE 1980's
9:00 pm 10/26/94 on HBO
This 30 minute special takes a look at the great boxing duels of the 1980's. Compiled form HBO's sports library and features Sugar Ray Leonard, the Spinks brothers, Mike Tyson, Boom Boom Mancini and many others. Includes the 10 greatest knockout punches landed in the 80's.
YOUR CHOICE TV
Press GO Here to Return to Schedule
Press GO Here to Return to Cable TV
1244

Fig. 32f

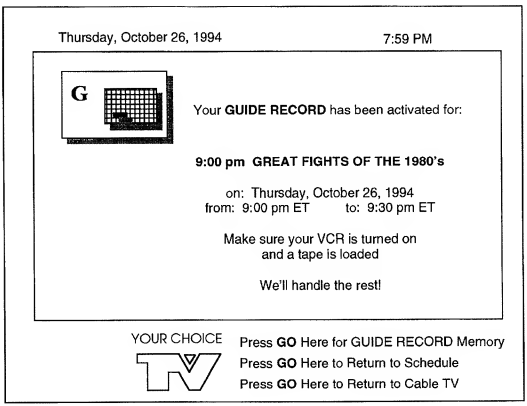

Thursday, October 26, 1994
7:59 PM
G
Your **GUIDE RECORD** has been activated for:
9:00 pm GREAT FIGHTS OF THE 1980's
on: Thursday, October 26, 1994
from: 9:00 pm ET to: 9:30 pm ET
Make sure your VCR is turned on
and a tape is loaded
We'll handle the rest!
YOUR CHOICE
Press **GO** Here for GUIDE RECORD Memory
Press **GO** Here to Return to Schedule
Press **GO** Here to Return to Cable TV
1248

Fig. 32g

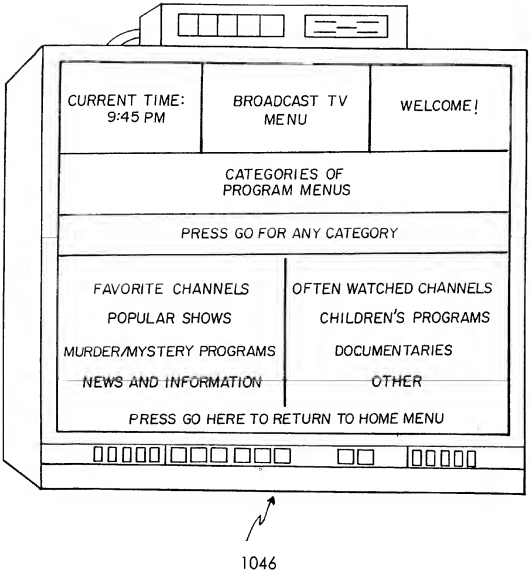
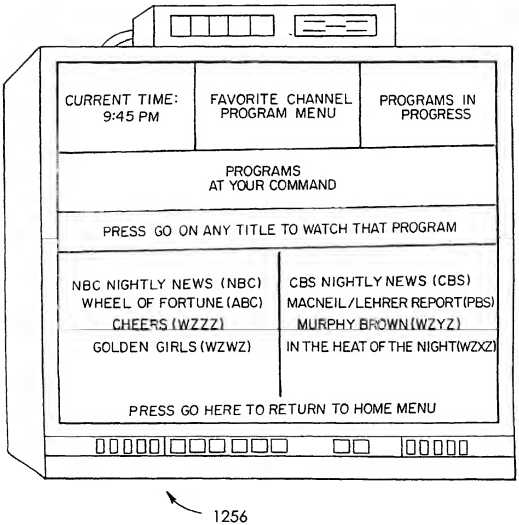

CURRENT TIME: 9:45 PM
BROADCAST TV MENU
WELCOME!
CATEGORIES OF PROGRAM MENUS
PRESS GO FOR ANY CATEGORY
FAVORITE CHANNELS
POPULAR SHOWS
MURDER/MYSTERY PROGRAMS
NEWS AND INFORMATION
OFTEN WATCHED CHANNELS
CHILDREN'S PROGRAMS
DOCUMENTARIES
OTHER
PRESS GO HERE TO RETURN TO HOME MENU
1046

Fig. 32h


CURRENT TIME: 9:45 PM
FAVORITE CHANNEL PROGRAM MENU
PROGRAMS IN PROGRESS
PROGRAMS AT YOUR COMMAND
PRESS GO ON ANY TITLE TO WATCH THAT PROGRAM
NBC NIGHTLY NEWS (NBC)
WHEEL OF FORTUNE (ABC)
CHEERS (WZZZ)
GOLDEN GIRLS (WZWZ)
CBS NIGHTLY NEWS (CBS)
MACNEIL/LEHRER REPORT (PBS)
MURPHY BROWN (WZYZ)
IN THE HEAT OF THE NIGHT (WZXZ)
PRESS GO HERE TO RETURN TO HOME MENU
1256

MOOD QUESTION MENUS

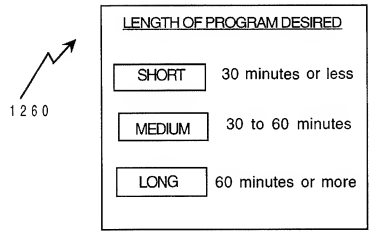


Fig. 32i

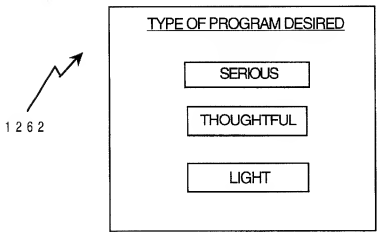


Fig. 32j

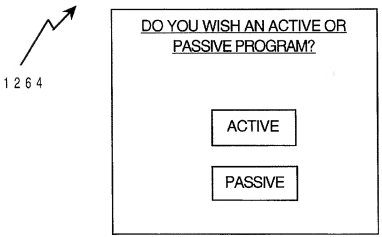


Fig. 32k

Fig. 33a

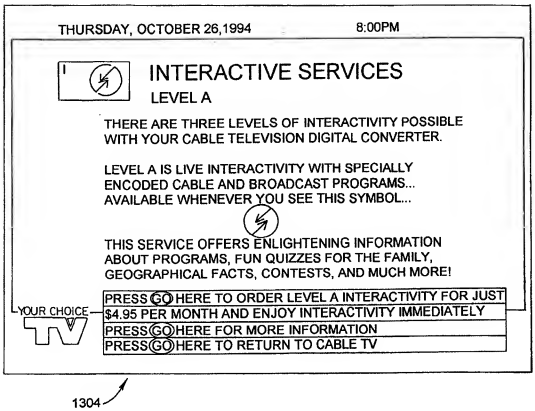

THURSDAY, OCTOBER 26,1994
8:00PM
INTERACTIVE SERVICES
LEVEL A
THERE ARE THREE LEVELS OF INTERACTIVITY POSSIBLE WITH YOUR CABLE TELEVISION DIGITAL CONVERTER.
LEVEL A IS LIVE INTERACTIVITY WITH SPECIALLY ENCODED CABLE AND BROADCAST PROGRAMS... AVAILABLE WHENEVER YOU SEE THIS SYMBOL...
THIS SERVICE OFFERS ENLIGHTENING INFORMATION ABOUT PROGRAMS, FUN QUIZZES FOR THE FAMILY, GEOGRAPHICAL FACTS, CONTESTS, AND MUCH MORE!
YOUR CHOICE
PRESS GO HERE TO ORDER LEVEL A INTERACTIVITY FOR JUST $4.95 PER MONTH AND ENJOY INTERACTIVITY IMMEDIATELY
PRESS GO HERE FOR MORE INFORMATION
PRESS GO HERE TO RETURN TO CABLE TV
1304

Fig. 33b

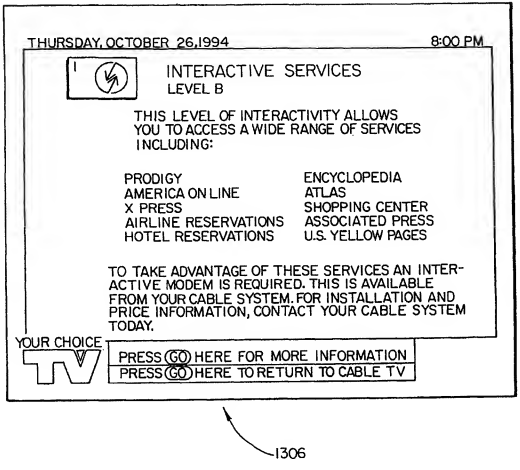

THURSDAY, OCTOBER 26,1994
8:00 PM
INTERACTIVE SERVICES
LEVEL B
THIS LEVEL OF INTERACTIVITY ALLOWS YOU TO ACCESS A WIDE RANGE OF SERVICES INCLUDING:
PRODIGY
AMERICA ON LINE
X PRESS
AIRLINE RESERVATIONS
HOTEL RESERVATIONS
ENCYCLOPEDIA
ATLAS
SHOPPING CENTER
ASSOCIATED PRESS
U.S. YELLOW PAGES
TO TAKE ADVANTAGE OF THESE SERVICES AN INTERACTIVE MODEM IS REQUIRED. THIS IS AVAILABLE FROM YOUR CABLE SYSTEM. FOR INSTALLATION AND PRICE INFORMATION, CONTACT YOUR CABLE SYSTEM TODAY.
YOUR CHOICE
PRESS GO HERE FOR MORE INFORMATION
PRESS GO HERE TO RETURN TO CABLE TV
1306

Fig. 33c

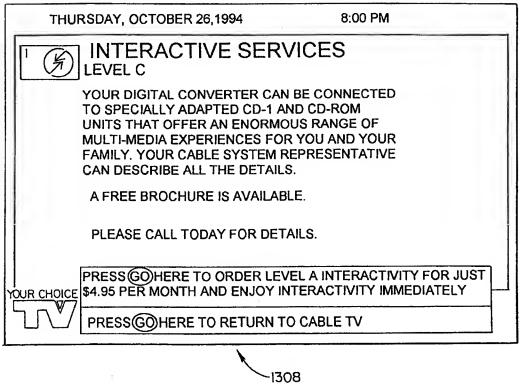

THURSDAY, OCTOBER 26,1994
8:00 PM
INTERACTIVE SERVICES
LEVEL C
YOUR DIGITAL CONVERTER CAN BE CONNECTED TO SPECIALLY ADAPTED CD-1 AND CD-ROM UNITS THAT OFFER AN ENORMOUS RANGE OF MULTI-MEDIA EXPERIENCES FOR YOU AND YOUR FAMILY. YOUR CABLE SYSTEM REPRESENTATIVE CAN DESCRIBE ALL THE DETAILS.
A FREE BROCHURE IS AVAILABLE.
PLEASE CALL TODAY FOR DETAILS.
YOUR CHOICE
PRESS GO HERE TO ORDER LEVEL A INTERACTIVITY FOR JUST $4.95 PER MONTH AND ENJOY INTERACTIVITY IMMEDIATELY
PRESS GO HERE TO RETURN TO CABLE TV
1308

Fig. 33d

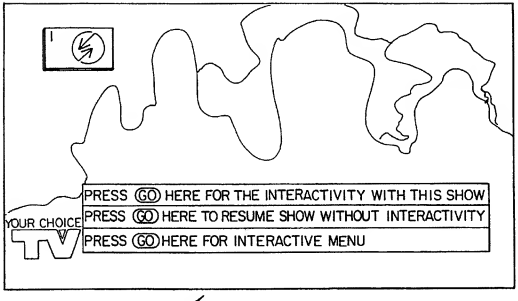

PRESS GO HERE FOR THE INTERACTIVITY WITH THIS SHOW
PRESS GO HERE TO RESUME SHOW WITHOUT INTERACTIVITY
PRESS GO HERE FOR INTERACTIVE MENU
YOUR CHOICE
TV
1310

Fig. 33e

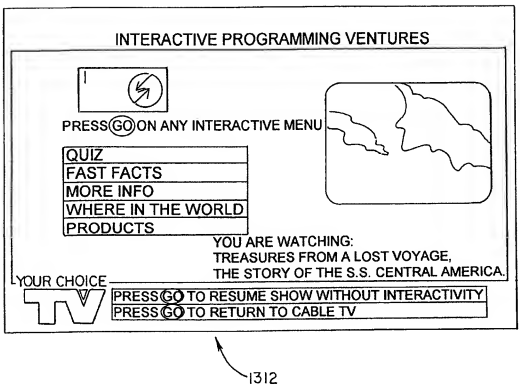

INTERACTIVE PROGRAMMING VENTURES
PRESS GO ON ANY INTERACTIVE MENU
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
YOU ARE WATCHING:
TREASURES FROM A LOST VOYAGE,
THE STORY OF THE S.S. CENTRAL AMERICA.
YOUR CHOICE
PRESS GO TO RESUME SHOW WITHOUT INTERACTIVITY
PRESS GO TO RETURN TO CABLE TV
1312

Fig. 33f

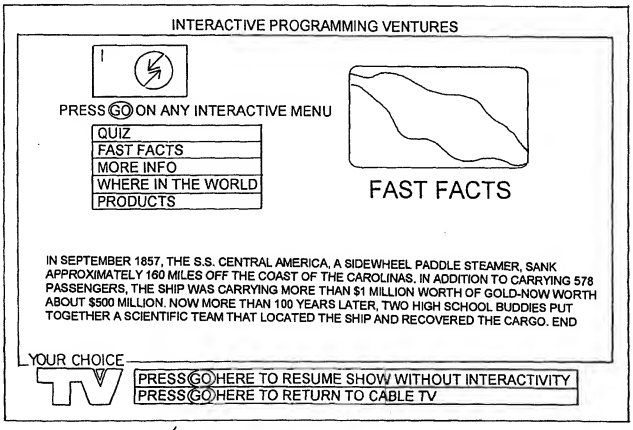

INTERACTIVE PROGRAMMING VENTURES
PRESS GO ON ANY INTERACTIVE MENU
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
FAST FACTS
IN SEPTEMBER 1857, THE S.S. CENTRAL AMERICA, A SIDEWHEEL PADDLE STEAMER, SANK APPROXIMATELY 160 MILES OFF THE COAST OF THE CAROLINAS. IN ADDITION TO CARRYING 578 PASSENGERS, THE SHIP WAS CARRYING MORE THAN $1 MILLION WORTH OF GOLD-NOW WORTH ABOUT $500 MILLION. NOW MORE THAN 100 YEARS LATER, TWO HIGH SCHOOL BUDDIES PUT TOGETHER A SCIENTIFIC TEAM THAT LOCATED THE SHIP AND RECOVERED THE CARGO. END
YOUR CHOICE
TV
PRESS GO HERE TO RESUME SHOW WITHOUT INTERACTIVITY
PRESS GO HERE TO RETURN TO CABLE TV
1314

Fig. 33g

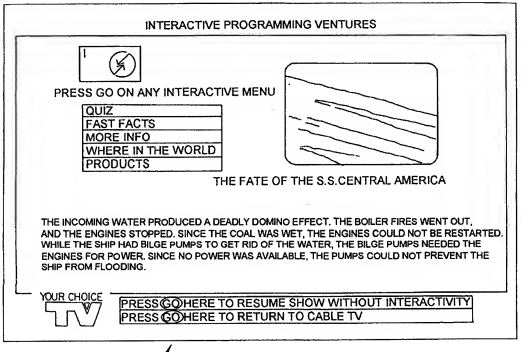

INTERACTIVE PROGRAMMING VENTURES
PRESS GO ON ANY INTERACTIVE MENU
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
THE FATE OF THE S.S.CENTRAL AMERICA
THE INCOMING WATER PRODUCED A DEADLY DOMINO EFFECT. THE BOILER FIRES WENT OUT, AND THE ENGINES STOPPED. SINCE THE COAL WAS WET, THE ENGINES COULD NOT BE RESTARTED. WHILE THE SHIP HAD BILGE PUMPS TO GET RID OF THE WATER, THE BILGE PUMPS NEEDED THE ENGINES FOR POWER. SINCE NO POWER WAS AVAILABLE, THE PUMPS COULD NOT PREVENT THE SHIP FROM FLOODING.
YOUR CHOICE
PRESS GO HERE TO RESUME SHOW WITHOUT INTERACTIVITY
PRESS GO HERE TO RETURN TO CABLE TV
1316

Fig. 33h

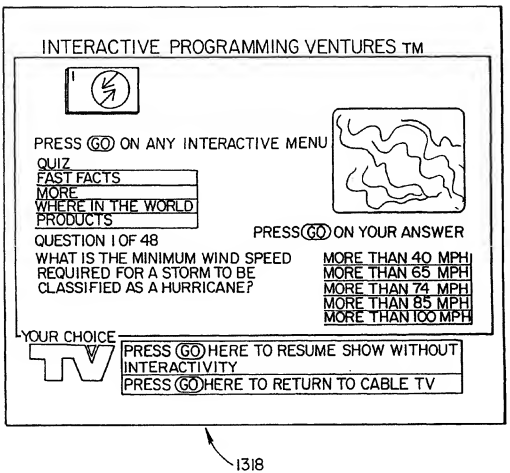

INTERACTIVE PROGRAMMING VENTURES TM
PRESS GO ON ANY INTERACTIVE MENU
QUIZ
FAST FACTS
MORE
WHERE IN THE WORLD
PRODUCTS
PRESS GO ON YOUR ANSWER
QUESTION 1 OF 48
WHAT IS THE MINIMUM WIND SPEED REQUIRED FOR A STORM TO BE CLASSIFIED AS A HURRICANE?
MORE THAN 40 MPH
MORE THAN 65 MPH
MORE THAN 74 MPH
MORE THAN 85 MPH
MORE THAN 100 MPH
YOUR CHOICE
PRESS GO HERE TO RESUME SHOW WITHOUT INTERACTIVITY
PRESS GO HERE TO RETURN TO CABLE TV
1318

Fig. 33i

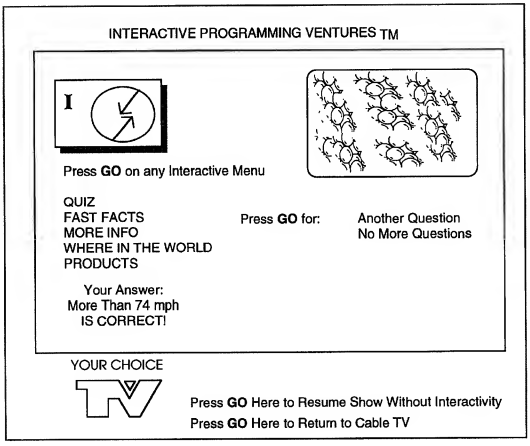

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO on any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Press GO for:
Another Question
No More Questions
Your Answer:
More Than 74 mph
IS CORRECT!
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here to Return to Cable TV
1320

Fig. 33j

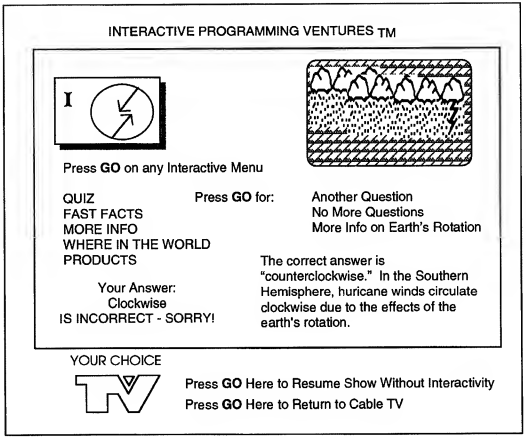

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO on any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Press GO for:
Another Question
No More Questions
More Info on Earth's Rotation
Your Answer:
Clockwise
IS INCORRECT - SORRY!
The correct answer is "counterclockwise." In the Southern Hemisphere, huricane winds circulate clockwise due to the effects of the earth's rotation.
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here to Return to Cable TV
1324

Fig. 34a

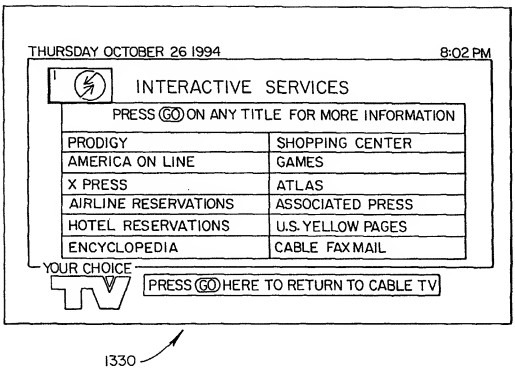

THURSDAY OCTOBER 26 1994
8:02 PM
INTERACTIVE SERVICES
PRESS GO ON ANY TITLE FOR MORE INFORMATION
PRODIGY
SHOPPING CENTER
AMERICA ON LINE
GAMES
X PRESS
ATLAS
AIRLINE RESERVATIONS
ASSOCIATED PRESS
HOTEL RESERVATIONS
U.S. YELLOW PAGES
ENCYCLOPEDIA
CABLE FAX MAIL
YOUR CHOICE
TV
PRESS GO HERE TO RETURN TO CABLE TV
1330

Fig. 34b

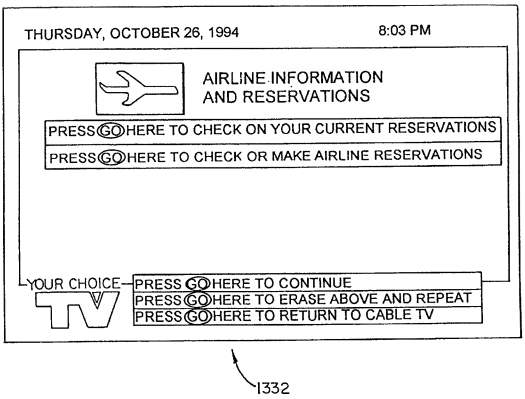

THURSDAY, OCTOBER 26, 1994
8:03 PM
AIRLINE INFORMATION
AND RESERVATIONS
PRESS GO HERE TO CHECK ON YOUR CURRENT RESERVATIONS
PRESS GO HERE TO CHECK OR MAKE AIRLINE RESERVATIONS
YOUR CHOICE
TV
PRESS GO HERE TO CONTINUE
PRESS GO HERE TO ERASE ABOVE AND REPEAT
PRESS GO HERE TO RETURN TO CABLE TV
1332

Fig. 34c

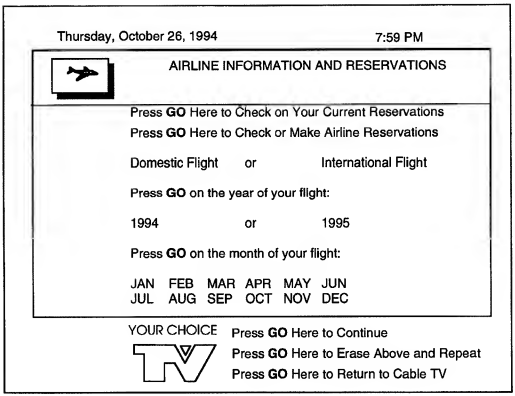
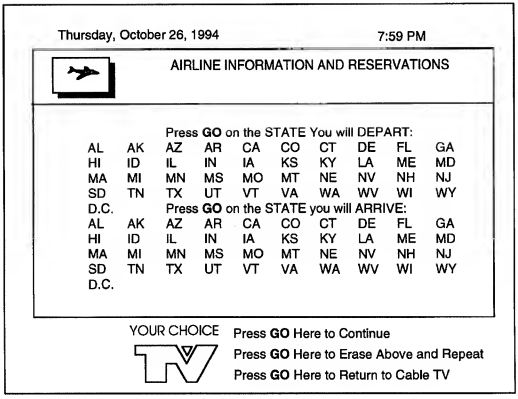
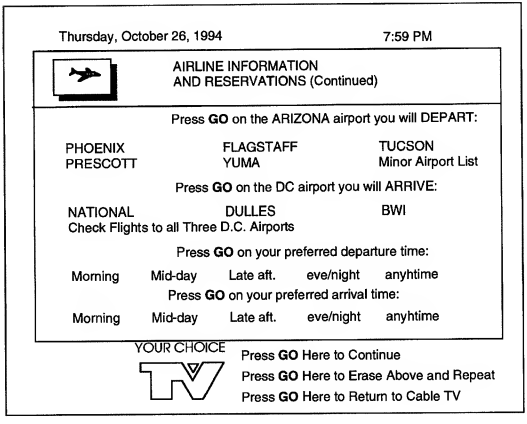

Thursday, October 26, 1994
7:59 PM
AIRLINE INFORMATION AND RESERVATIONS
Press GO Here to Check on Your Current Reservations
Press GO Here to Check or Make Airline Reservations
Domestic Flight or International Flight
Press GO on the year of your flight:
1994 or 1995
Press GO on the month of your flight:
JAN FEB MAR APR MAY JUN
JUL AUG SEP OCT NOV DEC
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV
1334

Fig. 34d


Thursday, October 26, 1994
7:59 PM
AIRLINE INFORMATION AND RESERVATIONS
Press GO on the STATE You will DEPART:
AL AK AZ AR CA CO CT DE FL GA
HI ID IL IN IA KS KY LA ME MD
MA MI MN MS MO MT NE NV NH NJ
SD TN TX UT VT VA WA WV WI WY
D.C.
Press GO on the STATE you will ARRIVE:
AL AK AZ AR CA CO CT DE FL GA
HI ID IL IN IA KS KY LA ME MD
MA MI MN MS MO MT NE NV NH NJ
SD TN TX UT VT VA WA WV WI WY
D.C.
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV

1336

Fig. 34e


Thursday, October 26, 1994
7:59 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
Press GO on the ARIZONA airport you will DEPART:
PHOENIX
PRESCOTT
FLAGSTAFF
YUMA
TUCSON
Minor Airport List
Press GO on the DC airport you will ARRIVE:
NATIONAL
Check Flights to all Three D.C. Airports
DULLES
BWI
Press GO on your preferred departure time:
Morning
Mid-day
Late aft.
eve/night
anyhtime
Press GO on your preferred arrival time:
Morning
Mid-day
Late aft.
eve/night
anyhtime
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV

1338

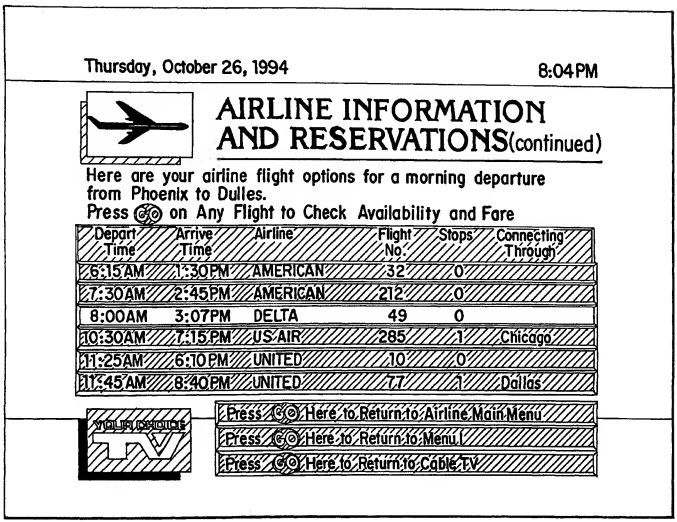
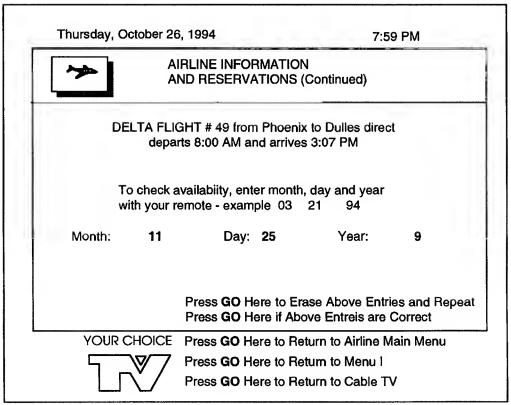

Thursday, October 26, 1994
8:04PM
AIRLINE INFORMATION AND RESERVATIONS(continued)
1340
Here are your airline flight options for a morning departure from Phoenix to Dulles.
Press GO on Any Flight to Check Availability and Fare
Depart Time
Arrive Time
Airline
Flight No.
Stops
Connecting Through
6:15 AM 1:30PM AMERICAN 32 0
7:30AM 2:45PM AMERICAN 212 0
8:00AM 3:07PM DELTA 49 0
10:30AM 7:15PM US AIR 285 1 Chicago
11:25AM 6:10PM UNITED 10 0
11:45AM 8:40PM UNITED 77 1 Dallas
YOUR CHOICE TV
Press GO Here to Return to Airline Main Menu
Press GO Here to Return to Menu 1
Press GO Here to Return to Cable TV

Fig. 34f

Fig. 34g


Thursday, October 26, 1994
7:59 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
DELTA FLIGHT # 49 from Phoenix to Dulles direct
departs 8:00 AM and arrives 3:07 PM
To check availabiity, enter month, day and year
with your remote - example 03 21 94
Month: 11 Day: 25 Year: 9
Press GO Here to Erase Above Entries and Repeat
Press GO Here if Above Entreis are Correct
YOUR CHOICE
Press GO Here to Return to Airline Main Menu
Press GO Here to Return to Menu I
Press GO Here to Return to Cable TV
1342

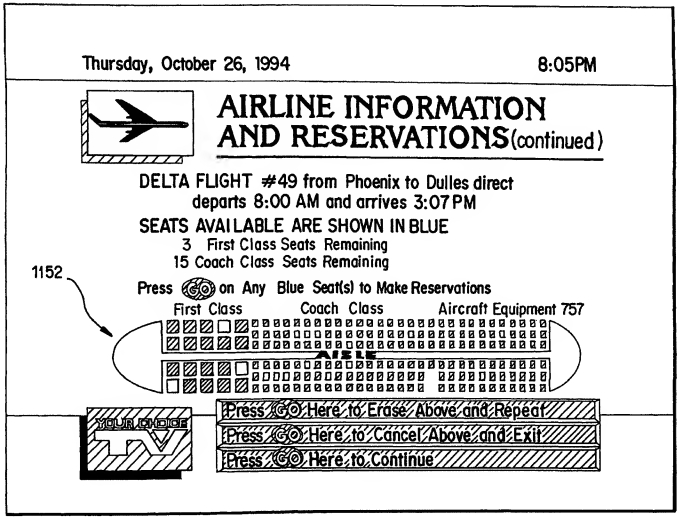
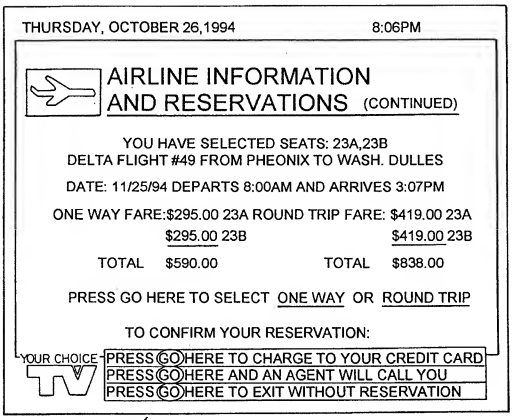

Thursday, October 26, 1994
8:05PM
AIRLINE INFORMATION
AND RESERVATIONS(continued)
DELTA FLIGHT #49 from Phoenix to Dulles direct
departs 8:00 AM and arrives 3:07PM
SEATS AVAILABLE ARE SHOWN IN BLUE
3 First Class Seats Remaining
15 Coach Class Seats Remaining
Press GO on Any Blue Seat(s) to Make Reservations
First Class
Coach Class
Aircraft Equipment 757
AISLE
YOUR CHOICE TV
Press GO Here to Erase Above and Repeat
Press GO Here to Cancel Above and Exit
Press GO Here to Continue
1152
1344

Fig. 34h

Fig. 34i


THURSDAY, OCTOBER 26,1994
8:06PM
AIRLINE INFORMATION
AND RESERVATIONS (CONTINUED)
YOU HAVE SELECTED SEATS: 23A,23B
DELTA FLIGHT #49 FROM PHEONIX TO WASH. DULLES
DATE: 11/25/94 DEPARTS 8:00AM AND ARRIVES 3:07PM
ONE WAY FARE:$295.00 23A ROUND TRIP FARE: $419.00 23A
$295.00 23B
$419.00 23B
TOTAL $590.00
TOTAL $838.00
PRESS GO HERE TO SELECT ONE WAY OR ROUND TRIP
TO CONFIRM YOUR RESERVATION:
YOUR CHOICE
PRESS GO HERE TO CHARGE TO YOUR CREDIT CARD
PRESS GO HERE AND AN AGENT WILL CALL YOU
PRESS GO HERE TO EXIT WITHOUT RESERVATION
1346

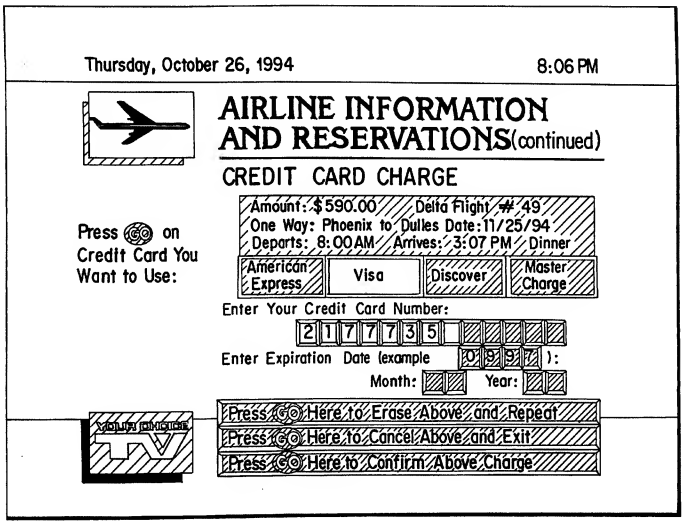

Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION AND RESERVATIONS(continued)
1348
CREDIT CARD CHARGE
Amount: $590.00
Delta Flight # 49
One Way: Phoenix to Dulles Date: 11/25/94
Departs: 8:00 AM
Arrives: 3:07 PM
Dinner
Press GO on Credit Card You Want to Use:
American Express
Visa
Discover
Master Charge
Enter Your Credit Card Number:
2 1 7 7 7 3 5
Enter Expiration Date (example 0 3 9 7):
Month:
Year:
Press GO Here to Erase Above and Repeat
Press GO Here to Cancel Above and Exit
Press GO Here to Confirm Above Charge

Fig. 34j

Fig. 34k

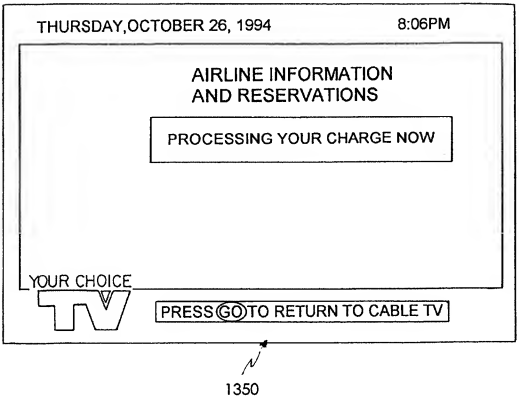
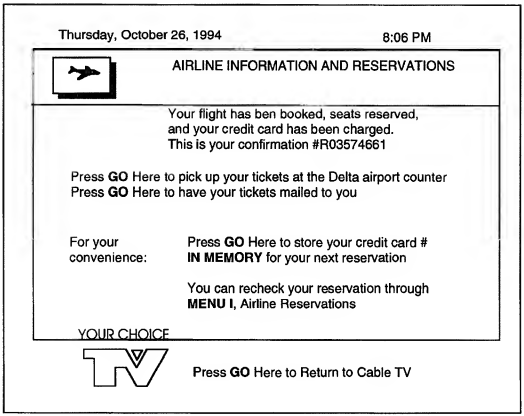

THURSDAY,OCTOBER 26, 1994
8:06PM
AIRLINE INFORMATION
AND RESERVATIONS
PROCESSING YOUR CHARGE NOW
YOUR CHOICE
TV
PRESS GO TO RETURN TO CABLE TV
1350

Fig. 34l


Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION AND RESERVATIONS
Your flight has ben booked, seats reserved,
and your credit card has been charged.
This is your confirmation #R035746661
Press GO Here to pick up your tickets at the Delta airport counter
Press GO Here to have your tickets mailed to you
For your convenience:
Press GO Here to store your credit card # IN MEMORY for your next reservation
You can recheck your reservation through MENU I, Airline Reservations
YOUR CHOICE
Press GO Here to Return to Cable TV
1352

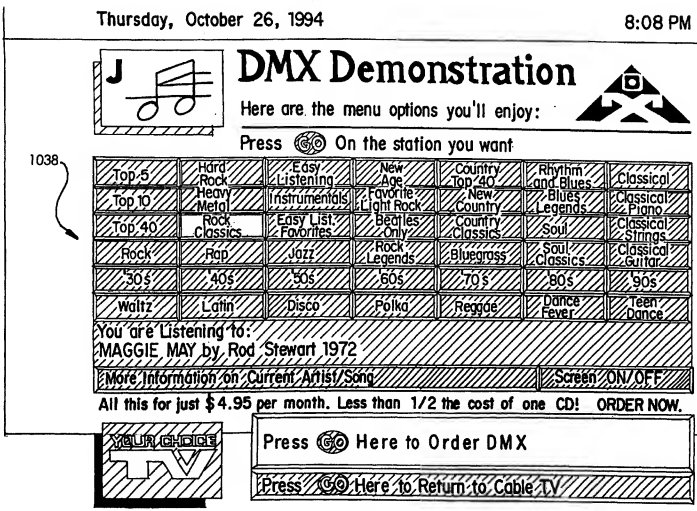

Thursday, October 26, 1994
8:08 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
1038
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rhythm and Blues
Classical
Top 10
Heavy Metal
Instrumentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
You are Listening to:
MAGGIE MAY by Rod Stewart 1972
More Information on Current Artist/Song
Screen ON/OFF
All this for just $4.95 per month. Less than 1/2 the cost of one CD! ORDER NOW.
YOUR CHOICE TV
Press GO Here to Order DMX
Press GO Here to Return to Cable TV

Fig. 35a

Fig. 35b

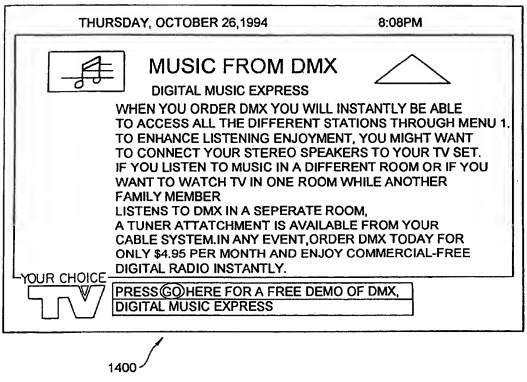

THURSDAY, OCTOBER 26,1994
8:08PM
MUSIC FROM DMX
DIGITAL MUSIC EXPRESS
WHEN YOU ORDER DMX YOU WILL INSTANTLY BE ABLE
TO ACCESS ALL THE DIFFERENT STATIONS THROUGH MENU 1.
TO ENHANCE LISTENING ENJOYMENT, YOU MIGHT WANT
TO CONNECT YOUR STEREO SPEAKERS TO YOUR TV SET.
IF YOU LISTEN TO MUSIC IN A DIFFERENT ROOM OR IF YOU
WANT TO WATCH TV IN ONE ROOM WHILE ANOTHER
FAMILY MEMBER
LISTENS TO DMX IN A SEPERATE ROOM,
A TUNER ATTATCHMENT IS AVAILABLE FROM YOUR
CABLE SYSTEM.IN ANY EVENT,ORDER DMX TODAY FOR
ONLY $4.95 PER MONTH AND ENJOY COMMERCIAL-FREE
DIGITAL RADIO INSTANTLY.
YOUR CHOICE
PRESS GO HERE FOR A FREE DEMO OF DMX,
DIGITAL MUSIC EXPRESS
1400

Fig. 35c

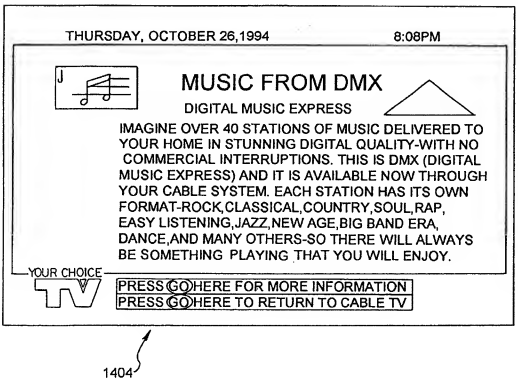

THURSDAY, OCTOBER 26,1994
8:08PM
MUSIC FROM DMX
DIGITAL MUSIC EXPRESS
IMAGINE OVER 40 STATIONS OF MUSIC DELIVERED TO YOUR HOME IN STUNNING DIGITAL QUALITY-WITH NO COMMERCIAL INTERRUPTIONS. THIS IS DMX (DIGITAL MUSIC EXPRESS) AND IT IS AVAILABLE NOW THROUGH YOUR CABLE SYSTEM. EACH STATION HAS ITS OWN FORMAT-ROCK,CLASSICAL,COUNTRY,SOUL,RAP, EASY LISTENING,JAZZ,NEW AGE,BIG BAND ERA, DANCE,AND MANY OTHERS-SO THERE WILL ALWAYS BE SOMETHING PLAYING THAT YOU WILL ENJOY.
YOUR CHOICE
PRESS GO HERE FOR MORE INFORMATION
PRESS GO HERE TO RETURN TO CABLE TV
1404

Fig. 35d

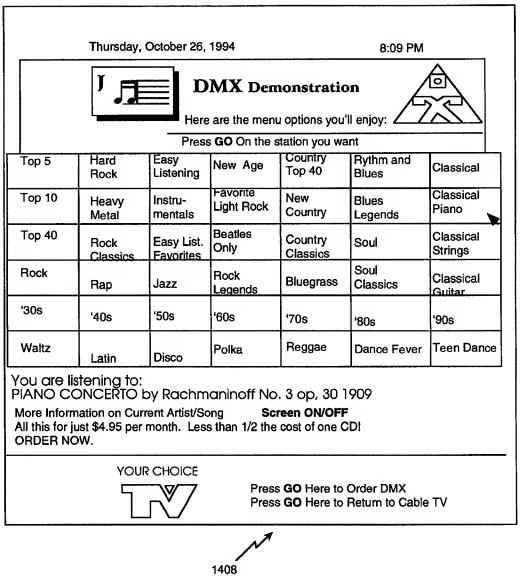

Thursday, October 26, 1994
8:09 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rythm and Blues
Classical
Top 10
Heavy Metal
Instru-mentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
You are listening to:
PIANO CONCERTO by Rachmaninoff No. 3 op. 30 1909
More Information on Current Artist/Song
Screen ON/OFF
All this for just $4.95 per month. Less than 1/2 the cost of one CD!
ORDER NOW.
YOUR CHOICE
Press GO Here to Order DMX
Press GO Here to Return to Cable TV
1408

Fig. 35e

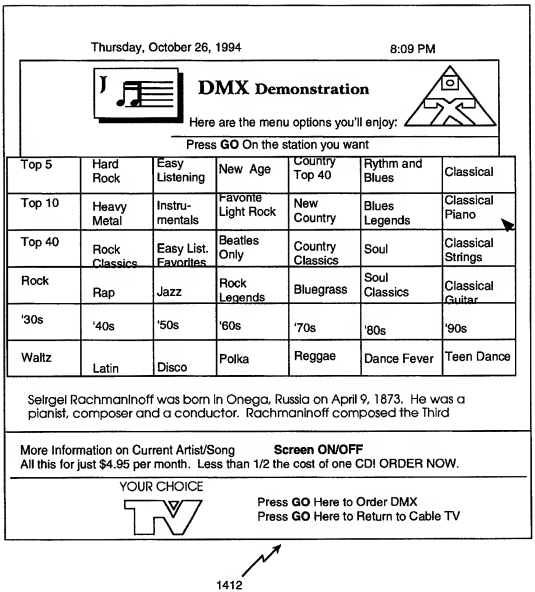

Thursday, October 26, 1994
8:09 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rythm and Blues
Classical
Top 10
Heavy Metal
Instru-mentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
Selrgel Rachmaninoff was born in Onega, Russia on April 9, 1873. He was a pianist, composer and a conductor. Rachmaninoff composed the Third
More Information on Current Artist/Song
Screen ON/OFF
All this for just $4.95 per month. Less than 1/2 the cost of one CD! ORDER NOW.
YOUR CHOICE
Press GO Here to Order DMX
Press GO Here to Return to Cable TV
1412

Fig. 36a

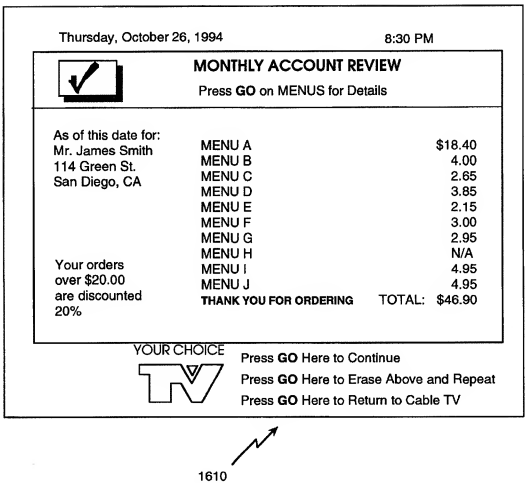

Thursday, October 26, 1994
8:30 PM
MONTHLY ACCOUNT REVIEW
Press GO on MENUS for Details
As of this date for:
Mr. James Smith
114 Green St.
San Diego, CA
MENU A $18.40
MENU B 4.00
MENU C 2.65
MENU D 3.85
MENU E 2.15
MENU F 3.00
MENU G 2.95
MENU H N/A
MENU I 4.95
MENU J 4.95
Your orders over $20.00 are discounted 20%
THANK YOU FOR ORDERING
TOTAL: $46.90
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV
1610

Fig. 36b

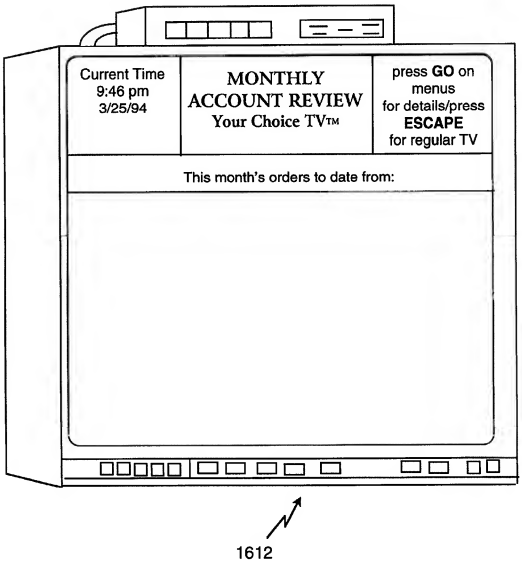

Current Time
9:46 pm
3/25/94
MONTHLY
ACCOUNT REVIEW
Your Choice TV™
press GO on
menus
for details/press
ESCAPE
for regular TV
This month's orders to date from:
1612

Fig. 37a

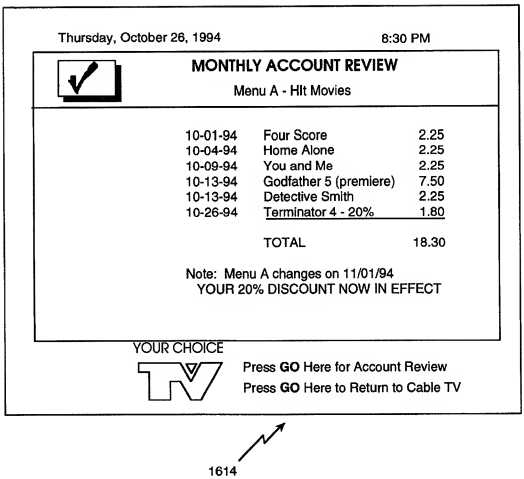
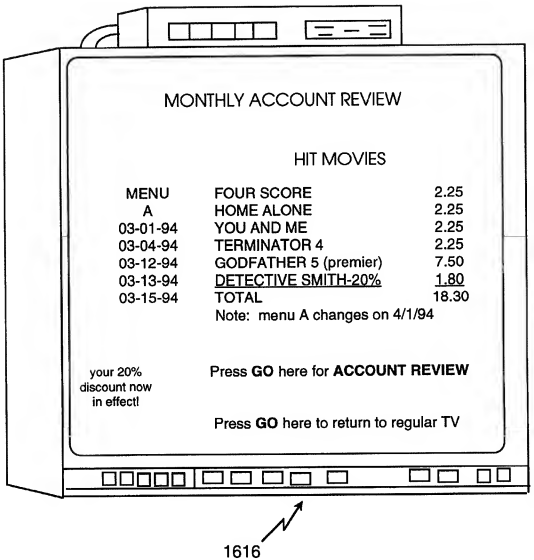

Thursday, October 26, 1994
8:30 PM
MONTHLY ACCOUNT REVIEW
Menu A - Hit Movies
10-01-94 Four Score 2.25
10-04-94 Home Alone 2.25
10-09-94 You and Me 2.25
10-13-94 Godfather 5 (premiere) 7.50
10-13-94 Detective Smith 2.25
10-26-94 Terminator 4 - 20% 1.80
TOTAL 18.30
Note: Menu A changes on 11/01/94
YOUR 20% DISCOUNT NOW IN EFFECT
YOUR CHOICE
Press GO Here for Account Review
Press GO Here to Return to Cable TV
1614

Fig. 37b


MONTHLY ACCOUNT REVIEW
HIT MOVIES
MENU
A
03-01-94
03-04-94
03-12-94
03-13-94
03-15-94
FOUR SCORE 2.25
HOME ALONE 2.25
YOU AND ME 2.25
TERMINATOR 4 2.25
GODFATHER 5 (premier) 7.50
DETECTIVE SMITH-20% 1.80
TOTAL 18.30
Note: menu A changes on 4/1/94
your 20% discount now in effect!
Press GO here for ACCOUNT REVIEW
Press GO here to return to regular TV
1616

OPERATIONS CENTER FOR A TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM

RELATED APPLICATIONS

This application is a continuation of Ser. No. 08/160,282 filed Dec. 2, 1993 which is a continuation-in-part of application Ser. No. 07/991,074, filed Dec. 9, 1992, entitled TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM WITH MENU DRIVEN SUBSCRIBER ACCESS. The following other continuation-in-part applications, also based on the above-referenced patent application, are incorporated herein by reference:

- Ser. No. 08/160,281, filed Dec. 2, 1993, entitled PROGRAMMABLE TERMINAL FOR SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY SYSTEM
- Ser. No. 08/160,280, filed Dec. 2, 1993, entitled NETWORK CONTROLLER FOR CABLE TELEVISION DELIVERY SYSTEMS
- Ser. No. 08/160,193, filed Dec. 2, 1993, entitled SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS
- Ser. No. 08/160,194, filed Dec. 2, 1993, entitled ADVANCED SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS
- Ser. No. 08/160,283, filed Dec. 2, 1993, entitled DIGITAL CABLE HEADEND FOR CABLE TELEVISION DELIVERY SYSTEM

TECHNICAL FIELD

The invention relates to television entertainment delivery systems that provide television programming to consumer homes. More particularly, the invention relates to an Operations Center that organizes and packages cable television programming for delivery to consumer homes.

BACKGROUND OF THE INVENTION

Advances in television entertainment have been primarily driven by breakthroughs in technology. In 1939, advances on Vladmir Zworykin's picture tube provided the stimulus for NBC to begin its first regular broadcasts. In 1975, advances in satellite technology provided consumers with increased programming to homes.

Many of these technology breakthroughs have produced inconvenient systems for consumers. One example is the ubiquitous three remote control home, having a separate and unique remote control for the TV, cable box and VCR. More recently, technology has provided cable users with 100 channels of programming. This increased program capacity is beyond the ability of many consumers to use effectively. No method of managing the program choices has been provided to consumers.

Consumers are demanding that future advances in television entertainment, particularly programs and program choices, be presented to the consumer in a user friendly manner. Consumer preferences, instead of technological breakthroughs, will drive the television entertainment market for at least the next 20 years. As computer vendors have experienced a switch from marketing new technology in computer hardware to marketing better useability, interfaces and service, the television entertainment industry will also experience a switch from new technology driving the market to consumer useability driving the market.

In order for new television entertainment products to be successful, the products must satisfy consumer demands. TV consumers wish to go from limited viewing choices to a variety of choices, from no control of programming to complete control. Consumers do not wish to pay for one hundred channels when due to lack of programming information, they seldom, if ever, watch programming on many of these channels.

The concepts of interactive television, high definition television and 300–500 channel cable systems in consumer homes will not sell if they are not packaged, delivered and presented in a useable fashion to consumers. The problem is that TV programming is not being managed, packaged, delivered, and presented to consumers in a user friendly manner.

Consumers are already being bombarded with programming options, numerous "free" cable channels, subscription cable channels and pay-per-view choices. Any further increase in TV entertainment choices will likely bewilder viewers with a mind-numbing array of choices.

The TV industry has traditionally marketed and sold its programs to consumers in bulk, such as continuous feed broadcast and long-term subscriptions to movie channels. The TV industry is unable to sell its programming in large quantities on a per unit basis, such as the ordering of one program.

In today's television world networks manage the program lineup for individual channels. Each network analyzes ratings for television shows and determines the appropriate schedule or program lineup to gain market share and revenue from advertising. Since each channel is in competition with every other channel, there is no coordinated effort to organize television programming in a manner that primarily suits the viewers.

Additionally, viewership fragmentation, which has already begun to decrease a channel's or program's market share, will increase. Programming not presented in a user friendly manner will suffer with a decrease in viewership and revenue.

And finally, with the imminent introduction of digital television technology, current television delivery systems do not have the capabilities or features necessary to operate in the digital environment.

What is needed is a method of organizing programming to be offered to viewers.

What is needed is a television program delivery system that can be operated in a distributive fashion and controlled from one or more national centers.

What is needed is an Operations Center for a system which can gather television programming in a variety of formats, package the programs, deliver the programs, and present the programs through a user friendly interface which allows the consumer to easily select from among the many program choices.

What is needed is an Operations Center that is capable of handling hundreds of programs in different formats.

What is needed is an Operations Center that is expandable for future types of programming.

What is needed is needed is an Operations Center that can control certain features and software of a television delivery system.

What is needed is an Operations Center that operates in the digital audio/video environment.

What is needed is an Operations Center that formulates program menus for viewer use.

What is needed is a computer assisted program packaging system.

What is needed is an Operations Center that includes a method for billing consumers.

What is needed is an Operations Center that analyzes data on programs watched by viewers.

The present invention is addressed to fulfillment of these needs.

SUMMARY OF INVENTION

This invention is a center for controlling the operations of a digital television program delivery system. Specifically, the present invention is an Operations Center that allows for the organizing and packaging of television programs for transmission in a television delivery system.

The Operations Center is the nerve center of the television program delivery system. It receives data on viewership behavior and utilizes the data to assist in packaging programs for future viewing. The Operations Center is a particularly useful invention for television delivery systems which will provide users with the ability to select programs from on-screen menus.

The Operations Center's primary component is a computer assisted packaging system (CAP), which makes use of the necessary hardware and software to control and transmit programming signals over a television delivery system. This computer assisted packaging system creates the program lineup or packaging of programs and the packaging of menu and control information for later transmission and use in the cable television systems. The CAP can be specially designed to generate graphical menu displays for user selection of programs. The hardware and software for controlling and transmitting programming signals over the television delivery system is particularly useful in large television delivery systems which include satellite transmissions to cable headends.

The software of the CAP performs the functions of gathering analog (and/or digital) program signals from a variety of sources such as broadcast television, premium channels, and video disk. The software also packages the programs efficiently for the available bandwidth and for subscriber viewing through computer assisted creation of program line-up and allocating of bandwidth. The line-ups are created to effectively group programming for display in menus by categories. The television programs are packaged with the program control information (such as cost for viewing certain program) and menu information.

The Operations Center of the present invention provides a method for remote management and control of local cable and CATV programs available and on-screen menu displays shown to subscribers. The Operations Center's computer software programs and hardware provide "real-time" control over cable and CATV systems. By transmitting appropriate control information the Operations Center has the ability to change allocation of programs across physical channels, update menu information (from the Operations Center location), reprogram menu formats and menu flow, and change or augment a packaged program signal sent to a particular region of the country. The Operations Center is able to control remotely certain features and software of the set top terminals and if necessary reprogram menu display software stored at the set top terminals.

In order to properly manage program lineups, the Operations Center acquires viewer information on programs watched. Such viewer information includes information about the buy rates of specific shows, viewer preferences for programming, and the like, gathered by recording viewer transactions. A compilation of viewer information data is needed in order to make decisions on future individualized program lineup and program packaging. In addition, allocation of menu space and construction of menus is aided by the use of viewer information data. This information is received from the set top terminals using a feedback loop, usually through the cable headends.

The present invention is not only able to operate in the digital environment but introduces many new features to television program delivery.

It is an object of this invention to provide a system for efficiently organizing television programs to be offered to viewers.

It is an object of this invention to provide an Operations Center for a television program delivery system.

It is an object of this invention to provide an Operations Center for a television program delivery system which can gather television programming in a variety of formats, package the programs, and deliver the packaged programs.

It is an object of this invention to provide an Operations Center for a program delivery system which presents programming viewing options to the consumer through a user friendly interface which allows the consumer to easily select from among the many program choices.

It is an object of this invention to provide an Operations Center that is capable of handling video/audio programming in different formats.

It is an object of this invention to provide an Operations Center capable of offering interactive television, high definition television (HDTV) and/or other advanced television features.

It is an object of this invention to provide an Operations Center that can control software and program features at the cable headend.

It is an object of this invention to provide an Operations Center that can control and if necessary reprogram set top terminals.

It is an object of this invention to provide an Operations Center for a digital program delivery system.

It is an object of this invention to provide an Operations Center that designs program menus.

It is an object of this invention to provide an Operations Center that uses data on programs viewed to create or aid in the selection of program line-ups.

It is an object of this invention to provide a computer assisted program packaging system for a television program delivery system.

These and other objects and advantages of the invention will become obvious to those skilled in the art upon review of the following description, the attached drawings and appended claims.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a diagram of the primary components of the television delivery system.

FIG. **2** is an overview of the television delivery system operations.

FIG. **3** is a schematic of the operation of the primary components of the system.

FIG. **4** is a schematic of the primary components of the Computer Assisted Packaging System (CAP).

FIG. **5** is a more detailed schematic of the hardware the Operations Center and CAP.

FIG. **6***a* is a chart of the program control information carried by the program control information signal.

FIG. **6***b* shows a bit-wise data format for program control information.

FIG. **7** is a block diagram showing a Delivery Control Processor Unit and a Computer Assisted Packaging Apparatus.

FIG. **8** is a schematic of the subroutines for the CAP software.

FIG. **9** is a software flowchart representing CAP operations.

FIG. **10** is a diagram of the database structure for the databases supporting the operations of the CAP.

FIG. **11** is a block diagram of the Operations Center and Master Control Site.

FIG. **12** is a block diagram of the computer assisted packaging shown in FIG. **11**.

FIG. **13** is a flow chart of the processing occurring at the Operations Center.

FIG. **14** is a diagram of the bandwidth allocation for a 750 Mhz system.

FIG. **15** is a diagram/chart of the compressed channel allocation for the system.

FIG. **16** is a diagram showing how three cable television systems each with a different bandwidth may use the program delivery system and operations center of the present invention simultaneously.

FIG. **17** is a diagram showing three different cable headend systems, each system receiving the entire satellite signal and stripping those parts of the signal which cannot be handled by the local cable system.

FIG. **18** is a diagram showing dynamic change in bandwidth allocation from a typical week day prime time program signal to a Saturday afternoon program signal.

FIG. **19** is a drawing of a broadcast television menu screen to be displayed on a set top terminal.

FIG. **20** is a drawing of a hit movie menu screen to be displayed on a set top terminal.

FIG. **21** is a drawing of a hit movie description menu screen to be displayed on a set top terminal.

FIG. **22** is a flow chart of the progression of primary menus in the menu driven system of the set top terminal.

FIG. **23***a* is a drawing of the basic menus used in the present invention, including the ten major menus represented by icons.

FIG. **23***b* is a drawing of the basic menus used in the present invention, in addition to FIG. **23***a*.

FIGS. **24***a* and **24***b* are drawings of introductory menus.

FIGS. **25***a*, **25***b*, **25***c* and **25***d* are drawings of home menus.

FIG. **26** is a drawing of an alternative of a home menu.

FIGS. **27***a*, **27***b*, **27***c*, **27***d*, **27***e*, **27***f* and **27***g* are drawings of major menus.

FIGS. **28***a* and **28***b* are drawings of hit movie description menus.

FIGS. **29***a* and **29***b* are drawings of hit movie notification submenus.

FIG. **30***a* is a drawing of a hit movie escape during program menu.

FIG. **30***b* is a drawing of a hit movie during program hidden menu.

FIG. **30***c* is a drawing of a hit movie re-entry submenu.

FIGS. **31***a* and **31***b* are drawings of menus related to high definition television programming.

FIGS. **32***a*, **32***b*, **32***c*, **32***d*, **32***e* and **32***f* are drawings of menus related to program guide services.

FIGS. **32***g* and **32***h* are drawings of broadcast television menus.

FIGS. **32***i*, **32***j* and **32***k* are drawings of mood question menus.

FIGS. **33***a*, **33***b*, and **33***c* are drawings of interactive television promotional menus, for Levels A–C.

FIGS. **33***d*, **33***e*, **33***f*, **33***g*, **33***h*, **33***i* and **33***j* are drawings of submenus for interactive television services, Level A.

FIGS. **34***a*, **34***b*, **34***c*, **34***d*, **34***e*, **34***f*, **34***g*, **34***h*, **34***i*, **34***j*, **34***k* and **34***l* are drawings of interactive services, Level B, particularly related to on-screen airline reservations.

FIGS. **35***a*, **35***b*, **35***c*, **35***d* and **35***e* are drawings of menus for digital audio services.

FIGS. **36***a*, **36***b*, **37***a* and **37***b* are drawings of monthly account menus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A. Television Program Delivery System Description

1. Introduction

FIG. **1** shows the present invention as part of an expanded cable television program delivery system **200** that dramatically increases programming capacity using compressed transmission of television program signals. Developments in digital bandwidth compression technology now allow much greater throughput of television program signals over existing or slightly modified transmission media. The program delivery system **200** shown provides subscribers with a user friendly interface to operate and exploit a six-fold or more increase in current program delivery capability.

Subscribers are able to access an expanded television program package and view selected programs through a menu-driven access scheme that allows each subscriber to select individual programs by sequencing a series of menus. The menus are sequenced by the subscriber using simple alpha-numeric and iconic character access or moving a cursor or highlight bar on the TV screen to access desired programs by simply pressing a single button, rather than recalling from memory and pressing the actual two or more digit numeric number assigned to a selection. Thus, with the press of a single button, the subscriber can advance from one menu to the next. In this fashion, the subscriber can sequence the menus and select a program from any given menu. The programs are grouped by category so that similar program offerings are found on the same menu.

2. Major System Components

In its most basic form, the system uses a program delivery system **200** in conjunction with a conventional concatenated cable television system **210**. The program delivery system **200** generally includes (i) at least one operations center **202**, where program packaging and control information are created and then assembled in the form of digital data, (ii) a digital compression system, where the digital data is compressed, combined/multiplexed, encoded, and mapped into digital signals for satellite transmission to the cable headend **208**, and (iii) a set of in-home decompressors. The program delivery system **200** transports the digital signals to the cable headend **208** where the signals are transmitted through a concatenated cable television system **210**. Within the cable headend **208**, the received signals may be decoded, demultiplexed, managed by a local central distribution and switching mechanism, combined and then transmitted to the

set top terminal **220** located in each subscriber's home over the cable system **210**. Although concatenated cable systems **210** are the most prevalent transmission media to the home, telephone lines, cellular networks, fiberoptics, Personal Communication Networks and similar technology for transmitting to the home can be used interchangeably with this program delivery system **200**.

The delivery system **200** has a reception region **207** with an in-home decompression capability. This capability is performed by a decompressor housed within a set top terminal **220** in each subscriber's home. The decompressor remains transparent from the subscriber's point of view and allows any of the compressed signals to be demultiplexed and individually extracted from the composite data stream and then individually decompressed upon selection by the subscriber. The decompressed video signals are converted into analog signals for television display. Such analog signals include NTSC formatted signals for use by a standard television. Control signals are likewise extracted and decompressed and then either executed immediately or placed in local storage such as a RAM. Multiple sets of decompression hardware may be used to decompress video and control signals. The set top terminal **220** may then overlay or combine different signals to form the desired display on the subscriber's television. Graphics on video or picture-on-picture are examples of such a display.

Although a single digital compression standard (e.g., MPEG) may be used for both the program delivery system **200** and the concatenated cable system **210**, the compression technique used may differ between the two systems. When the compression standards differ between the two media, the signals received by the cable headend **208** must be decompressed before transmission from the headend **208** to the set top terminals **220**. Subsequently, the cable headend **208** must recompress and transmit the signals to the set top terminal **220**, which would then decompress the signals using a specific decompression algorithm.

The video signals and program control signals received by the set top terminal **220** correspond to specific television programs and menu selections that each subscriber may access through a subscriber interface. The subscriber interface is a device with buttons located on the set top terminal **220** or on a portable remote control **900**. In the preferred system embodiment, the subscriber interface is a combined alpha-character, numeric and iconic remote control device **900**, which provides direct or menu-driven program access. The preferred subscriber interface also contains cursor movement and go buttons as well as alpha, numeric and iconic buttons. This subscriber interface and menu arrangement enables the subscriber to sequence through menus by choosing from among several menu options that are displayed on the television screen. In addition, a user may bypass several menu screens and immediately choose a program by selecting the appropriate alpha-character, numeric or iconic combinations on the subscriber interface. In the preferred embodiment, the set top terminal **220** generates the menus that are displayed on the television by creating arrays of particular menu templates, and the set top terminal **220** displays a specific menu or submenu option for each available video signal.

3. Operations Center and Digital Compression System

The operations center **202** performs two primary services, packaging television programs and generating the program control information signal. At the operations center **202**, television programs are received from external program sources in both analog and digital form. FIG. 2 shows an embodiment of the operations center receiving signals from various external sources **212**. Examples of the external program sources are sporting events, children's programs, specialty channels, news or any other program source that can provide audio or visual signals. Once the programs are received from the external program sources, the operations center **202** digitizes (and preferably compresses) any program signals received in analog form. The operations center **202** may also maintain an internal storage of programs. The internally stored programs may be in analog or digital form and stored on permanent or volatile memory sources, including magnetic tape or RAM. Subsequent to receiving programming, the operations center **202** packages the programs into the groups and categories which provide the optimal marketing of the programs to subscribers. For example, the operations center **202** may package the same programs into different categories and menus for weekday, prime-time viewing and Saturday afternoon viewing. Also, the operations center **202** packages the television programs in a manner that enables both the various menus to easily represent the programs and the subscribers to easily access the programs through the menus.

The packaging of the digital signals is typically performed at the operations center **202** by computer assisted packaging equipment (CAP). The CAP system normally includes at least one computer monitor, keyboard, mouse, and standard video editing equipment. A programmer packages the signals by entering certain information into the CAP. This information includes the date, time slot, and program category of the various programs. The programmer and the CAP utilize demographic data and ratings in performing the packaging tasks. After the programmer selects the various programs from a pool of available programs and inputs the requisite information, the programmer, with assistance from the CAP, can select the price and allocate transponder space for the various programs. After the process is complete, the CAP displays draft menus or program schedules that correspond to the entries of the programmer. The CAP may also graphically display allocation of transponder space. The programmer may edit the menus and transponder allocation several times until satisfied with the programming schedule. During the editing, the programmer may direct the exact location of any program name on a menu with simple commands to the CAP.

The packaging process also accounts for any groupings by satellite transponder which are necessary. The operations center **202** may send different groups of programs to different cable headends **208** and/or set top terminals **220**. One way the operations center **202** may accomplish this task is to send different program packages to each transponder. Each transponder, or set of transponders, then relays a specific program package to specific cable headends **208** and/or set top terminals **220**. The allocation of transponder space is an important task performed by the operations center **202**.

The operations center **202** may also "insert" directions for filling local available program time in the packaged signal to enable local cable and television companies to fill the program time with local advertising and/or local programming. Consequently, the local cable headends **208** are not constrained to show only programs transmitted from the operations center **202**. New set top converters will incorporate both digital and analog channels. Therefore, the cable headend **208** may combine analog signals with the digital signals prior to transmitting the program signals to the set top terminals **220**.

After the CAP packages the programs, it creates a program control information signal to be delivered with the program package to the cable headend **208** and/or set top

terminal **220**. The program control information signal contains a description of the contents of the program package, commands to he sent to the cable headend **208** and/or set top terminal **220**, and other information relevant to the signal transmission.

In addition to packaging the signal, the operations center **202** employs digital compression techniques to increase existing satellite transponder capacity by at least a 4:1 ratio, resulting in a four-fold increase in program delivery capahility. A number of digital compression algorithms currently exist which can achieve the resultant increase in capacity and improved signal quality desired for the system. The algorithms generally use one or more of three hasic digital compression techniques: (1) within-frame (intraframe) compression, (2) frame-to-frame (interframe) compression, and (3) within carrier compression. Specifically, in the preferred embodiment, the MPEG 2 compression method is used. After digital compression, the signals are combined (multiplexed) and encoded. The combined signal is subsequently transmitted to various uplink sites **204**.

There may he a single uplink site **204** or multiple uplink sites (represented hy **204'**, shown in phantom in FIG. **1**) for each operation center **202**. The uplink sites **204** may either he located in the same geographical place or may be located remotely from the operations center **202**. Once the composite signal is transmitted to the uplink sites **204**, the signal may he multiplexed with other signals, modulated, upconverted and amplified for transmission over satellite. Multiple cable headends **208** may receive such transmissions.

In addition to multiple uplinks, the delivery system **200** may also contain multiple operations centers. The preferred method for using multiple operations centers is to designate one of the operations centers as a master operations center and to designate the remaining operations centers as slave operations centers. In this configuration, the master operations center coordinates various functions among the slave operations centers such as synchronization of simultaneous transmissions and distributes the operations workload efficiently.

4. Cable Headend

After the operations center **202** has compressed and encoded the program signals and transmitted the signals to the satellite, the cable headend **208** receives and further processes the signals before they are relayed to each set top terminal **220**. Each cable headend site is generally equipped with multiple satellite receiver dishes. Each dish is capable of handling multiple transponder signals from a single satellite and sometimes from multiple satellites.

With reference to FIG. **3**, as an intermediary between the set top terminals **220** and the operations center **202** and master control uplink site **211** (or other remote site), the cahle headend **208** performs two primary functions. First, the cable headend **208** acts as a distribution center, or signal processor, hy relaying the program signal to the set top terminal **220** in each subscriber's home. In addition, the cable headend **208** acts as a network controller **214** hy receiving information from each set top terminal **220** and passing such information on to an information gathering site such as the operations center **202**.

FIG. **3** shows an embodiment where the cahle headend **208** and the subscriher's home are linked hy certain communications media **216**. In this particular embodiment, analog signals, digitally compressed signals, other digital signals and up-stream/interactivity signals are sent and received over the media **216**. The cahle headend **208** provides such signaling capabilities in its dual roles as a signal processor **209** and network controller **214**.

As a signal processor **209**, the cahle headend **208** prepares the program signals that are received hy the cahle headend **208** for transmission to each set top terminal **220**. In the preferred system, the signal processor **209** re-routes or demultiplexes and recombines the signals and digital information received from the operations center **202** and allocates different portions of the signal to different frequency ranges. Cahle headends **208** which offer different subscribers different program offerings may allocate the program signals from the operations center **202** in various manners to accommodate different viewers. The signal processor **209** may also incorporate local programming and/or local advertisements into the program signal and forward the revised signal to the set top terminals **220**. To accommodate this local programming availability, the signal processor **209** must combine the local signal in digital or analog form with the operations center program signals. If the local cahle system uses a compression standard that is different than the one used hy the operations center **202**, the signal processor **209** must also decompress and recompress incoming signals so they may he properly formatted for transmission to the set top terminals **220**. This process becomes less important as standards develop (i.e., MPEG 2). In addition, the signal processor **209** performs any necessary signal decryption and/or encryption.

As a network controller **214**, the cahle headend **208** performs the system control functions for the system. The primary function of the network controller **214** is to manage the configuration of the set top terminals **220** and process signals received from the set top terminals **220**. In the preferred embodiment, the network controller **214** monitors, among other things, automatic poll-hack responses from the set top terminals **220** remotely located at each subscribers' home. The polling and automatic report-hack cycle occurs frequently enough to allow the network controller **214** to maintain accurate account and hilling information as well as monitor authorized channel access. In the simplest embodiment, information to he sent to the network controller **214** will be stored in RAM within each subscriber's set top terminal **220** and will he retrieved only upon polling hy the network controller **214**. Retrieval may, for example, occur on a daily, weekly or monthly hasis. The network controller **214** allows the system to maintain complete information on all programs watched using a particular set top terminal **220**.

The network controller **214** is also able to respond to the immediate needs of a set top terminal **220** hy modifying a program control information signal received from the operations center **202**. Therefore, the network controller **214** enables the delivery system to adapt to the specific requirements of individual set top terminals **220** when the requirements cannot he provided to the operations center **202** in advance. In other words, the network controller **214** is able to perform "on the fly programming" changes. With this capability, the network controller **214** can handle sophisticated local programming needs such as, for example, interactive television services, split screen video, and selection of different foreign languages for the same video. In addition, the network controller **214** controls and monitors all compressors and decompressors in the system.

The delivery system **200** and digital compression of the preferred embodiment provides a one-way path from the operations center **202** to the cable headend **208**. Status and billing information is sent from the set top terminal **220** to the network controller **214** at the cable headend **208** and not directly to the operations center **202**. Thus, program monitoring and selection control will take place only at the cable headend **208** hy the local cahle company and its decentral-

ized network controllers **214** (i.e., decentralized relative to the operations center **202**, which is central to the program delivery system **200**). The local cahle company will in turn he in communication with the operations center **202** or a regional control center (not shown) which accumulates return data from the set top terminal **220** for statistical or hilling purposes. In alternative system embodiments, the operations center **202** and the statistical and billing sites are collocated. Further, telephone lines with modems are used to transfer information from the set top terminal **220** to the statistical and hilling sites.

5. Set Top Terminal

The set top terminal **220** is the portion of the delivery system **200** that resides in the home of a subscriher. The set top terminal **220** is usually located above or helow the subscriber's television, hut it may he placed anywhere in or near the subscriher's home as long as it is within the range of the subscriher's remote control device **900**. In some aspects, the set top terminal **220** may resemhle converter hoxes already used by many cahle systems. For instance, each set top terminal **220** may include a variety of error detection, decryption, and coding techniques such as anti-taping encoding. However, it will hecome apparent from the discussion helow that the set top terminal **220** is ahle to perform many functions that an ordinary converter hox cannot perform.

The set top terminal **220** has a plurality of input and output ports to enahle it to communicate with other local and remote devices. The set top terminal **220** has an input port that receives information from the cahle headend **208**. In addition, the unit has at least two output ports which provide communications from the set top terminal **220** to a television and a VCR Certain menu selections may cause the set top terminal **220** to send control signals directly to the VCR to automatically program or operate the VCR. Also, the set top terminal **220** contains a phone Jack which can be used for maintenance, trouhle shooting, reprogramming and additional customer features. The set top terminal **220** may also contain stereo/audio output terminals and a satellite dish input port.

Functionally, the set top terminal **220** is the last component in the delivery system chain. The set top terminal **220** receives compressed program and control signals from the cahle headend **208** (or, in some cases, directly from the operations center **202**). After the set top terminal **220** receives the individually compressed program and control signals, the signals are demultiplexed, decompressed, converted to analog signals (if necessary) and either placed in local storage (from which the menu template may be created), executed immediately, or sent directly to the television screen.

After processing certain signals received from the cahle headend **208**, the set top terminal **220** is ahle to store menu templates for creating menus that are displayed on a suhscriher's television hy using an array of menu templates. Before a menu can he constructed, menu templates must he created and sent to the set top terminal **220** for storage. A microprocessor uses the control signals received from the operations center **202** or cahle headend **208** to generate the menu templates for storage. Each menu template may he stored in volatile memory in the set top terminal **220**. When the set top terminal receives template information it demultiplexes the program control signals received from the cable headend **208** into four primary parts: video, graphics, program logic and text. Each menu template represents a different portion of a whole menu, such as a menu background, television logo, cursor highlight overlay, or other miscellaneous components needed to build a menu. The menu templates may he deleted or altered using control signals received from the operations center **202** or cahle headend **208**.

Once the menu templates have been stored in memory, the set top terminal **220** can generate the appropriate menus. In the preferred embodiment, the hasic menu format information is stored in memory located within the set top terminal **220** so that the microprocessor may locally access the information from the set top terminal instead of from an incoming signal. The microprocessor next generates the appropriate menus from the menu templates and the other menu information stored in memory. The set top terminal **220** then displays specific menus on the subscriber's television screen that correspond to the inputs the subscriber selects.

If the subscriher selects a specific program from a menu, the set top terminal **220** determines on which channel the program is being shown, demultiplexes and extracts the single channel transmitted from the cahle headend **208**. The set top terminal **220** then decompresses the channel and, if necessary, converts the program signal to an analog NTSC signal to enable the subscriher to view the selected program. The set top terminal **220** can he equipped to decompress more than one program signal, hut this would unnecessarily add to the cost of the unit since a subscriher will generally only view one program at a time. However, two or three decompressors may he desirahle to provide picture-on-picture capability, control signal decompression, enhanced channel switching or like features.

In addition to menu information, the set top terminal **220** may also store text transmitted from the cahle headend **208** or the operations center **202**. The text may inform the subscriher about upcoming events, hilling and account status, new suhscriptions, or other relevant information. The text will he stored in an appropriate memory location depending on the frequency and the duration of the use of the textual message.

Also, optional upgrades are available to enhance the performance of a subscriher's set top terminal **220**. These upgrades may consist of a cartridge or computer card (not shown) that is inserted into an expansion slot in the set top terminal **220** or may consist of a feature offered hy the cahle headend **208** or operations center **202** to which the user may subscribe. Available upgrades may include on line data hase services, interactive multi-media services, access to digital radio channels, and other services.

In the simplest emhodiment, available converter boxes such as those manufactured by General Instruments or Scientific Atlanta, may he modified and upgraded to perform the functions of a set top terminal **220**. The preferred upgrade is a circuit card with a microprocessor which is electronically connected to or inserted into the converter hox.

6. Remote Control Device

The primary conduit for communication between the subscriher and the set top terminal **220** is through the subscriher interface, preferahly a remote control device **900**. Through this interface, the suhscriher may select desired programming through the system's menu-driven scheme or by directly accessing a specific channel hy entering the actual channel number. Using the interface, the subscriber can navigate through a series of informative program selection menus. By using menu-driven, iconic or alpha-character access, the subscriher can access desired programs hy simply pressing a single hutton rather than recalling from memory and pressing the actual channel number to make a

selection. The subscriber can access regular broadcast and basic cable television stations by using either the numeric keys on the remote control **900** (pressing the corresponding channel number), or one of the menu icon selection options.

In addition to enabling the subscriber to easily interact with the cable system **200**, the physical characteristics of the subscriber interface **900** should also add to the user friendliness of the system. The remote control **900** should easily fit in the palm of the user's hand. The buttons of the preferred remote control **900** contain pictorial symbols that are easily identifiable by the subscriber. Also, buttons that perform similar functions may be color coordinated and consist of distinguishing textures to increase the user friendliness of the system.

7. Menu-Driven Program Selection

The menu-driven scheme provides the subscriber with one-step access to all major menus, ranging from hit movies to sport specials to specialty programs. From any of the major menus, the subscriber can in turn access submenus and minor menus by cursor or alpha-character access.

There are two different types of menus utilized by the preferred embodiment, the Program Selection menus and the During Program menus. The first series of menus, Program Selection menus, consists of an Introductory, a Home, Major menus, and Submenus. The second series of menus, During Program menus, consists of two primary types, Hidden menus and the Program Overlay menus.

Immediately after the subscriber turns on the set top terminal **220**, the Introductory menu welcomes the subscriber to the system. The Introductory menu may display important announcements from the local cable franchise, advertisements from the cable provider, or other types of messages. In addition, the Introductory menu can inform the subscriber if the cable headend **208** has sent a personal message to the subscriber's particular set top terminal **220**.

After the Introductory menu has been displayed the subscriber may advance to the next level of menus, namely the Home menu. In the preferred embodiment, after a certain period of time, the cable system will advance the subscriber by default to the Home menu. From the Home menu, the subscriber is able to access all of the programming options. The subscriber may either select a program directly by entering the appropriate channel number from the remote control **900**, or the subscriber may sequence through incremental levels of menu options starting from the Home menu. The Home menu lists categories that correspond to the first level of menus called Major menus.

If the subscriber chooses to sequence through subsequent menus, the subscriber will be forwarded to the Major menu that corresponds to the chosen category from the Home menu. The Major menus further refine a subscriber's search and help guide the subscriber to the selection of his choice.

From the Major menus, the subscriber may access several submenus. From each submenu, the subscriber may access other submenus until the subscriber finds a desired television program. Similar to the Major menu, each successive level of Submenus further refines the subscriber's search. The system also enables the subscriber to skip certain menus or submenus and directly access a specific menu or television program by entering the appropriate commands on the remote control **900**.

The During program menus (including Hidden Menus and Program Overlay Menus) are displayed by the set top terminal **220** only after the subscriber has selected a television program. In order to avoid disturbing the subscriber, the set top terminal **220** does not display the Hidden Menus until the subscriber selects the appropriate option to display a Hidden Menu. The Hidden Menus contain options that are relevant to the program selected by the viewer. For example, a Hidden Menu may contain options that enable a subscriber to enter an interactive mode or escape from the selected program.

Program Overlay Menus are similar to Hidden Menus because they occur during a program and are related to the program being viewed. However, the Program Overlay Menus are displayed concurrently with the program selected by the subscriber. Most Program Overlay Menus are small enough on the screen to allow the subscriber to continue viewing the selected program comfortably.

B. Operations Center with Computer Assisted Packaging System

FIG. **4** broadly shows the configuration for the computer assisted packaging system (CAP) **260** of the Operations Center **202**. The primary components of the CAP **260** consist of multiple packager workstations **262**, a central processing unit **264**, video/audio editing equipment **266**, and one or more databases **268** and **269**. Additional remotely located databases, such as local video storage database **267**, and buffers **271** and controllers **272** for external program feeds make up the peripherals of the CAP system **260**.

The heart of the CAP **260** is a central processing unit **264** which communicates with all the component parts of the CAP **260**. The central processing unit **264** can be a powerful PC, a mini-computer, a mainframe or a combination of computing equipment running in parallel. The central processing unit **264** includes all the necessary interconnections to control peripheral equipment such as the external video controls **272**. The central processing unit **264** has sufficient memory **274** to store the program instructions of the subroutines which operate the CAP **260**.

The CAP **260** receives data from one or more databases, such as the Operations Center Database **268** and the Cable Franchise Information Database **269** shown in FIG. **4**. In addition, separate databases are maintained of viewer information, such as demographics and programs viewed. The CAP **260** can control the reception of external sources by enabling and disenabling the external video controls **272**. The external video controls **272** include buffers to delay as necessary external programs received by the Operations Center **202**.

The functions of the video/audio equipment **266** include digitizing analog programs, digitizing and compressing analog programs (in a single step, e.g., MPEG), and compressing digital program signals as requested by the central processing unit **264**.

The CAP **260** receives video and audio from two sources: internally from a local video storage **267** and externally from external sources through external video controls **272**. When necessary, video is manipulated, formatted and/or digitized using video/audio equipment **266** which is controlled by CAP **264**.

Referring back to FIG. **2**, an overview of an operating cable television menu driven program delivery system **200** highlighting various external programming signal sources **212** is depicted. The Operations Center **202** is shown receiving external programming signals which correspond to particular programming categories that are available for a subscriber's viewing. These external signals may be in analog or digital form and may be received via landline, microwave transmission, or satellite. Some of these external signals may be transmitted from the program source **212** to the Operations Center **202** in compressed digital format or other nonstandard digital formats. These external signals are received and packaged with programming that is stored at

the Operations Center **202**. Examples of external program sources **212** shown in FIG. **2** are: Sporting events, children's programs, documentaries, high definition TV sources, specialty channels, interactive services, weather, news, and other nonfiction or entertainment. Any source that can provide either audio or video or both may be utilized to provide programming to the Operations Center **202**.

In order to achieve the required throughput of video and audio information for the system, digital compression techniques are employed. A television signal is first digitized. The object of digitization is two-fold: First, in the case of an analog signal, like a television picture, digitization allows the signal to be converted from a waveform into a digital hinary format. Secondly, through the use of digital compression techniques, standard digital formats are designed to have the resulting pictures or video stills take up less space on their respective storage mediums. Essentially, as described below, a standard digital format will define the method of compression used.

There are three hasic digital compression techniques: within-frame (intraframe), frame-to-frame (interframe), and within-carrier. Intraframe compression processes each frame in a television picture to contain fewer visual details and, therefore, the picture contains fewer digital bits. Interframe compression transmits only changes between frames, thus omitting elements repeated in successive frames. Within-carrier compression allows the compression ratio to dynamically vary depending upon the amount of changes between frames. If a large number of changes occur between frames, the compression ratio drops from, for example, sixteen-to-one to eight-to-one. If action is intense, the compression ratio may dip to four to one.

Several standard digital formats representing hoth digitizing standards and compression standards have been developed. For example, JPEG (joint photographic experts group) is a standard for single picture digitization. Motion picture digitization may be represented hy standards such as MPEG or MPEG 2(motion picture engineering group specifications). Other proprietary standards have been developed in addition to these. The preferred embodiment uses the MPEG-2 standard of coding and those of ordinary skill in the art are presumed to he familiar with the MPEG-2 standard. The MPEG-2 Systems Working Draft Proposal from the Systems Committee of the International Organization For Standardization, document ISO/IE JT1/SC29/WG11"N0531" MPEG93 dated Sep. 10, 1993, is hereby incorporated hy reference. Although MPEG and MPEG2 for motion pictures are preferred in the present invention, any reliable digital format with compression may he used with the present invention.

Various hybrids of the ahove compression techniques have been developed hy several companies including AT&T, Compression Labs, Inc., General Instrument, Scientific-Atlanta, Phillips, and Zenith. As is known by those skilled in the art, any of the compression techniques developed hy these companies, and other known techniques, may be used with the present invention.

With reference to FIG. **4**, the human intervention in this system is conducted by a programmer or program packager operating from the one or more work stations **262** connected to the system. These work stations **262** are preferahly intelligent work stations with large CRT screens. In the preferred embodiment, a suitable keyboard, mouse and color monitor are used with the workstation. From these work stations, the packager can create program lineups, prioritize programs, initiate dynamic menu allocation, initiate dynamic bandwidth allocation, design menus, place program names and descriptions onto menus, create menus with still and live video, move text on menus, change the colors of objects on menus and perform various other tasks for the program delivery system **200**.

Almost any Operations Center **202** function that normally requires human intervention can be conducted at the packager workstation **262**. Although data entry for the databases can be performed manually at the workstations **262**, it is preferred that the data entry be completed through electronic transfers of information. Alternatively, the data can be loaded from customary portahle storage media such as magnetic disks or tape.

An integral part of the Computer Assisting Packaging system is the retrieval of viewer data, and the assimilation of that data into the program packaging method (especially the menu configuration) as discussed in reference to FIG. **8** MII **402**. This involves two main steps, first, retrieval of raw data from the set top terminals, and then filtering and presenting that data. Each headend **208** compiles the viewer data, and then sends it verbatim to the Operations Center **202**. This raw data is necessary because different responsihilities of the Operations Center **202** require different parts of the raw information. Also a record must be kept of overall data. Once the data is assembled at the Operations Center **202**, the data is filtered for each application.

The raw data gathered includes but is not limited to:

What programs a viewer purchased and when it was purchased

What channel a specific viewer watched and for how long.

This information can then he used to calculate the following:

How many viewers watched a particular program.

Peak viewing times for different categories of shows.

Buy rates for particular menu positions.

Menu creation, hoth automatically and manually, is one of the major CAP functions that involves the incorporation of the raw data. An automated software procedure (such as the EIS) analyzes the data and, using certain heuristics, creates the menus.

One heuristic, for example, is that when a show is not ordered frequently, it is moved closer to the top of the menu for greater visibility. The filtering of the data allows it to be sorted and indexed for display to the user. The program data can be filtered into a new database containing program names and indexed hy the number of times each program was purchased. The data can also he indexed hy buy times and program categories.

Certain metrics are established to help in evaluating the data. Using the EIS or similar software, sales hy menu placement, cost, category and lifespan can be pulled up for viewing in graphic presentation. The graphic presentation, in the form of line or bar graphs, help the packager recognize any trends in the data. For example, the first movie on a movie menu might not have sold as well as a second movie listed. A chart can he pulled up to reveal that the first movie has heen at the top of the menu for two weeks and huy rates are naturally falling off. Steps can then he taken to move items in the menus to correct this, though many of these steps are automated in the menu creation system. Suggested changes can he displayed to help the user in this task.

The automated procedures create menus that are distinct between headends **208** because of demographic differences in the viewing audience. To help with this, a separate datahase of viewer demographics exists and is frequently updated. The headends **208** are ahle to alter the menu positions in order to further tailor the presentation, or to add

local shows. Any changes to the menus are sent back to the Operations Center **202** at the same time as the viewer data, in order to prevent erroneous data analysis. Menu changes at the cable headend are described in detail in co-pending patent application Ser. No. 08/160,280, filed Dec. 2, 1993, entitled Network Controller for a Cable Television System, filed by the same assignee.

Another use for the indexed data is creation of marketing reports. Programming changes are helped by accurate information on viewer preference. Also viewer purchasing trends, and regional interests can be tracked.

In the preferred embodiment, an Executive Information System (EIS) is used to give high level access to both "buy" (what the customer purchases) and "access" (when the product was viewed, how often and duration) data. The EIS represents information in both a graphical and summary report format. "Drill down" functions in the EIS help the packager derive the appropriate product (product refers to programs, events or services) mix.

The purpose of the EIS is to provide an on-line software tool that will allow for real-time evaluation of current product positioning. The design of the system consists of user friendly icons to guide the user through available functions. The functionality in the system provides general information on current programming sales status. By working through the tiers in the system, the user has access to more specific information. The system is designed to shield the user from a long learning curve and information overload.

The graphical tools allow for analysis of current data through the use of multiple graph types such as line graphs, bar and pie charts. These tools will allow the user to manipulate independent variables such as time (hour, day of the week, week, month), demographic information, program category information (genre, property, events), headend information and pricing information for determining the appropriate programming mix within the allotted time slots.

The system also allows the packager to derive expected monetary returns through program line-ups by integrating outside industry databases. For instance, the system could be used to determine expected returns from a particular program by correlating buy information from the existing programs in the line up with a viewer ratings service database to determine the outcome of programs within a particular genre not in the current line up.

Report tools within the EIS aggregate buy access at the highest level. Due to the volume of available information statistical analysis methods are used for deriving marketing intelligence within the EIS.

A yield management tool is incorporated within the EIS. The yield management tool encompasses operations research techniques, statistical methods and neural net technology to decide program mix as it pertains to program substitutes, program complements, time slice positioning, repetitions and menu positioning.

This system is automated to the extent of providing viable alternative as to the proposed product mix. The system encompasses a Monte Carlo simulation for developing alternative product mix scenarios. The system feeds from both internal data and external industry data sources to provide expected revenue projections for the different scenarios. Other software subroutines of the CAP will automatically call upon the EIS to assist the program in important decision making, such as menu configuration and transponder allocation. Human interaction is required to change marketing parameters for fine tuning the desired product scheduling.

Although the packaging of the program information and programs, including the creation of program control information, program lineup and menu designing configuration, is conducted at the CAP **260**, all other functions of the Operations Center **202** can be controlled by a second separate processing unit (shown in FIG. **5** at **270**). This second processing unit **270** is the Delivery Control Processing Unit **270**, and can perform the tasks of incorporating the program control information signal from the CAP **260**, coordinating the receipt and combining of external program video/audio and internal video/audio and combining the signals as necessary for transmission. This distribution of functions among the CAP **260** and Delivery Control Processing Unit **270** allows for greater speed and ease of use.

FIG. **5** shows a more detailed diagram of the CAP **260** and the Delivery Control Processor Unit **270**. Once external and stored digital and analog sources have been converted into a standard digital format **274**, they are input into standard digital multiplex equipment **273** (of the type manufactured by Scientific Atlanta, General Instruments, and others). Additionally, the Program Control Information Signal **276** is input into the digital multiplex equipment **273**. These inputs **274**, **276** are multiplexed appropriately under the control of the Delivery Control Processor Unit **270** as commanded by the CPU **264**. The Delivery Control Processor Unit **270** is also responsible for the generation of the Program Control Information Signal **276** based on information received from the CPU **264**. The Delivery Control Processor Unit **270** allows for the off-loading of real-time and near real-time tasks from the CPU **264**. The CPU **264**, as described earlier, processes information within its database and provides user access to the CAP **260** via multiple user workstations **262**. The high-speed digital output **278** from the digital multiplex equipment **273** is then sent on to the compression (if necessary), multiplexing, modulation and amplification hardware, represented at **279**.

C. The Program Control Information Signal

The following table, TABLE A, is an example of some information that can he sent in the program control information signal to the set top terminals **220**. The program control information signal generated by the Operations Center **202** provides data on the scheduling and description of programs via the network controller **214** or, in an alternate configuration, directly to the set top terminal **220** for display to the subscriber.

In the preferred embodiment, the program control information signal **276** is stored and modified by the network controller **214** and sent to the set top terminal **220** in the form of a set top terminal control information stream (STTCIS). This configuration accommodates differences in individual cable systems and possible differences in set top converter or terminal devices. The set top terminal **220** of the present invention integrates either the program control signal **276** or the STTCIS, together with data stored in the memory of the set top terminal **220**, to generate on-screen menu displays for assisting the subscriber in choosing programs for viewing. throughout the description the term "program control information" is being used to indicate control information coming from the cable headend **208** to the set top terminal **220**, whether it is sent directly from the Operations Center **202**, processed by the network controller **214**, and then forwarded to the set top terminal as STTCIS, or transmitted over telephone lines.)

With further reference to TABLE A below, the types of information that can he sent via the program control signal include: number of program categories, names of program categories, what channels are assigned to a specific category (such as specialty channels), names of channels, names of

programs on each channel, program start times, length of programs, description of programs, menu assignment for each program, pricing, whether there is a sample video clip for advertisement for the program, and any other program, menu or product information.

The goal of the menu driven program selection system of the present invention, described in greater detail in a co-pending U.S. Patent application entitled SET TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEM, Ser. No. 08/160,193, filed Dec. 2, 1993, owned hy the assignee of the present invention and incorporated herein hy reference, is to allow the subscriber to choose a program hy touring through a series of menus utilizing a remote control **900** for cursor movement. The final choice in the series of menus will identify one particular channel and one time for activation of that channel. Armed with a channel and activation time the set top terminal **220** can display the selected program on the television for the viewer. To achieve this goal, an intelligent alpha-numeric code is assigned to each program. This alpha-numeric code identifies the category of the program, the menu in which the program should he displayed, its transmission time(s), and the position on the menu that the program should he displayed. In a preferred embodiment, the program control information, including menu codes, is sent continuously from the Operations Center **202** to the network controller **214**, and ultimately to the set top terminal **220**. For example, four hours worth of programming information can he sent via the program control information signal continuously in the format shown in TABLE A.

TABLE A

*Program name		*Program length	*Menu code	*Description	*Video
			12 PM		
1	Cheers	.5	E24	C	N
2	Terminator	2.0	A33	Tx	S
3	PrimeTime	1.0	D14	N	N
4	Football Special	.5	B24	S	N
			12:30 PM		
1	Simpsons	.5	E14 & C13	C	S
4	Football Game	3.0	B13	S	N

TABLE A shows the hasic information that is needed by the set top terminal **220**. The program descriptions shown are coded ahhreviations. For example, C stands for comedy, N for news, S for sports, A for cartoons, and TX for text. If there is a textual description for a program, such as a movie, the description may he given following that program's coded description or may he communicated following the four hours of programming information. As is shown in the coded listing, program descriptions for programs greater than a half hour in length need not be repeated (each half hour). The video description code informs the set top terminal **220** whether there is still or live video available to advertise the program.

For example, a sporting program may be assigned a code of B35-010194-1600-3.25-Michigan St. vs. USC. The letter B would assign the program to category B, sports. The second alpha-numeric character numher 3 would assign the program to the third menu of the sports category. The third character of the code, numher 5, assigns the program to the fifth program slot on the third menu. The next six characters, 1/01/94, represent the date. The following four characters, 1600 represent the start time which is followed hy the length of the program and the program name. This entry represents a sports show, a college football game, which will be aired at 4:00 PM on New Years day 1994.

In the 12:30 Channel 1 entry of TABLE A, two menu codes are shown. By allowing two menu codes, programs that may fit under two different category descriptions may he shown in both menus to the subscriber. With this minimal amount of information being communicated to the set top terminal **220** on a regular basis, the terminal is ahle to determine the proper menu location for each program and the proper time and channel to activate for the subscriber after his menu selection. In the preferred embodiment, the menu codes are generated at the Operations Center **202**.

Table B shows an example Events Table that may be downloaded to a set top terminal **220** using the Event Data file which contains information about events and pricing. As shown in the tahle, the three columns of the Events Table identify the field number, the field itself and the type of information downloaded in the Event Data file. The first column contains the field numbers 1 through 11. The middle column contains the corresponding field parameters, including the event type, event ID, global channel ID, price, start time, end time, start date, end date, P- icon, name and description. The third column contains corresponding field type information. As shown in this field type information typically consists of an unsigned integer; hours, minutes and seconds; months, day and year; and ASCII character identifier.

TABLE B

Field #	Field	Type
1	Event Type 1 = YCTV 2 = Pay-Per-View 3 = Reg. TV	Unsigned Int
2	Event ID	Unsigned Int
3	Global Channel ID	Unsigned Int
4	Price (in Cents)	Unsigned Int
5	Start Time	HH:MM:SS
6	End Time	HH:MM:SS
7	Start Date	MM/DD/YY
8	End Date	MM/DD/YY
9	P-Icon	ASCIIZ
10	Name	ASCIIZ
11	Description	ASCIIZ

Table C shows an example Event Data data file. In particular, Tahle C shows two data streams corresponding to two event types. The first data stream identifies a YCTV event in the first field. The second field designates the event ID, which is 1234 in this example. The third field includes the global channel ID number two. The fourth field indicates the cost of 50 cents for this event. The fifth and sixth fields indicate the respective start and end times of 3:00 a.m. to 3:00 p.m., respectively. The seventh and eighth fields show the corresponding start and end date, designated as 8/25/93 and 8/27/93, respectively. Field nine indicates the P icon set to a graphics file. Finally, fields ten and eleven indicate the name and description of the event selected, which in this case is Sesame Street™ and Barney™. The second data stream in the Event.Dat example shown in Tahle C includes analogous information for Terminator IV™, which is designated in field one as a pay-per-view event.

TABLE C

Event Data Example
1'12342'5'003:00:00'15:00:00'08/25/93'08/27/93'pbs.pcx'Sesame Street & Barney's Sesame Street and Barney Abstract 2'12342'5'020:00:00'22:00:00'08/25/93'08/25/93'14.pcx'Terminator 4'Terminator 4 Abstract

The program control information signal **276** and STTCIS can be formatted in a variety of ways and the on-screen menus can be produced in many different ways. For instance, if the program control information signal **276** carries no menu format information, the menu format for creating the menus can be fixed in ROM at the set top terminal **220**. This method allows tbe program control signal **276** to carry less information but bas the least flexibility since the menu formats cannot be changed without physically swapping the ROM holding the menu format information. In the preferred embodiment, the menu format information is stored at the set top terminal **220** in temporary memory either in a RAM or EPROM. This configuration provides the desired flexibility in the menu format while still limiting the amount of information needed to be communicated via tbe program control information signal **276**. New menu format information would be sent via the program control information signal **276** or the STTCIS to the set top terminals **220** each time there was a change to a menu.

In the simplest embodiment, the menus remain fixed and only the text changes. Thus, tbe program control information signal **276** can be limited to primarily text and a text generator can be employed in the set top terminal **220**. This simple embodiment keeps the cost of the set top terminal **220** low and limits the bandwidth necessary for the program control information. Another simple embodiment uses a separate channel full-time (large bandwidth) just for tbe menu information.

FIGS. *6a* and *6b*, particularly FIG. *6a*, show a data format **920** at the bit-level for one embodiment of a program information signal **276**. This frame format consists of six fields, namely: (1) a leading flag **922** at the beginning of the message, (2) an address field **924**, (3) a subscriber region designation **926**, (4) a set top terminal identifier **928** that includes a polling command/response (or P/F) bit **930**, (5) an information field **932**, and (6) a trailing flag **934** at tbe end of the message.

The eight-bit flag sequence tbat appears at the beginning **922** and end **927** of a frame is used to establish and maintain synchronization. Such a sequence typically consists of a "01111110" bit-stream. The address field **924** designates a 4-bit address for a given set top terminal **220**. The subscriber region designation **926** is a 4-bit field that indicates tbe geographical region in which the subscriber's set top terminal **220** is housed. The set top terminal identifier **928** is a 16-bit field that uniquely identifies each set top terminal **220** with a 15-bit designation followed by an appended P/F bit **930**. Although field size is provided by tbis example, a variety of sizes can be used with tbe present invention.

The P/F bit **930** is used to command a polling response **920**' (FIG. *6b*) from the set top terminal **220** addressed. The polling response **920**' is substantially similar to the frem format **920**, and is commonly numbered, but with a prime () designation appended for clarity. The frame format **920** also provides a variable-length information field **932** for other data transmissions, such as information on system updates. The frame format ends with an 8-bit flag **934** (or trailing flag) that is identical in format to the leading flag **922**, as set forth above. Other frame formats, such as MPEG, for example, will he apparent to one skilled in the art and can be easily adapted for use with the system.

D. Software Subroutines

The program control information signal **276** is produced substantially by tbe CAP CPU **264** and the Delivery Control Processor Unit (DCPU) **270**. An overview of tbe software modules, focusing on the processing of signals and communication between CAP CPU **264** and DCPU **270** is sbown in FIG. **7**. The software modules for the CAP CPU **264** and DCPU **270** include dispatcber **484**, processing **486** and communications **488**, each of wbicb performs like-named functions, as well as supporting database **490** access. Processing within the CAP CPU **264** is controlled by the dispatcher **484** software module whicb may generate processing commands based on user command (e.g., do something now), schedule events (e.g., do something at noon) or based on tbe occurrence of other events (e.g., do something when the database is updated). The dispatcher **484** sends messages to the processing software module **486** instructing it to process information within tbe database **490** and generate control information for the DCPU **270**. For example, based on the updating of information associated with a particular headend **208**, tbe dispatcher **484** may command the CAP CPU **264** to regenerate headend **208** parameters, perform any required database integrity checking and send them to the DCPU **270**. Also, in the case of headend **208** information processing, a filtering function (not shown) is performed which eliminates any information that does not either directly or indirectly relate to a given headend **208**. Information transfer between the CAP CPU **264** and the DCPU **270** is controlled by the DCPU communications software module **488**.

Information received by the DCPU **270** from the CAP CPU **264** is processed at the DCPU processing module **496** and put into a form consistent with the DCPU **270**. Some of this information is used for DCPU control, wbile most is data to be integrated into the program control information signal **261**. Some of this information is also used for miscellaneous control **494** for such things as external multiplex equipment, source material generation hardware, transmission equipment and so on. Information destined for the program control information signal **261** may be transmitted once or may be scheduled for periodic transmission. This information is integrated by the processing module **496** witb other information, both internal and external. The DCPU scbeduler module **497** is responsible for scheduling and regulating this data traffic. Also, the scheduler **497** may perform information filtering. For example, imbedded date/time information within tbe information records of interest can be used for filtering. External pass-through control information **495** may also be incorporated into the program control information signal **261** to provide external input to this digital data stream. The DCPU multiplexer **498** is responsible for multiplexing external pass-through control Information. Finally, a transmission software module **499** in conjunction with appropriate communications bardware (not sbown), controls tbe output of botb the program control information signal **261** and the miscellaneous control signals **494**.

FIG. **8** is a high level diagram of CAP software subroutines and their interrelations. A Main Program (not shown) orchestrates the use of the various subroutines as needed to perform tbe CAP's tasks. The Packager Data Entry Interface (PDEI) **400**, Marketing Information Interface (MII) **402**, and Cable Franchise Information Access (CFIA) **404** subroutines perform the interface functions between the CAP Main

Program and outside data or information. The remaining subroutines shown in the center column of FIG. **8** perform the processing and manipulations necessary to the functioning of the CAP **260**.

The Packager Data Entry Interface (PDEI) **400** subroutine includes routines that enable the Packager to interactively enter program selections **410**, start times of programs **412**, price setting **414**, transponder allocation **416**, and menu editing **418**. The PDEI subroutine **400** controls the keyboard and mouse data entry by the packager and runs in concert with the processing and editing subroutines described later.

The Marketing Information Interface (MII) **402** subroutine interfaces the processing and editing subroutines with marketing data. This interface regularly receives programs watched information from hilling sites **420**, cable headends **208**, or set top terminals **220**. In addition, other marketing information **422** such as the demographics of viewers during certain time periods may be received by the MII **402**. The MII **402** also uses algorithms **424** to analyze the program watched information and marketing data **420**, **422**, and provides the analyzed information to the processing and editing subroutines. In the preferred embodiment, an Executive Information System (EIS) with a yield management subsystem is included in the MII subroutine as described above.

The Cable Franchise Information Access (CFIA) **404** subroutine receives information on cable franchises, as represented at hlock **426**, such as the particular equipment used in a cable headend **208**, the number of set top terminals **220** within a cable franchise, groupings of set top terminals **220** on concatenated cable systems **210**, distribution of "high-end" cable subscribers, etc. The CFIA **404** generates a cable franchise control signal **428** which is integrated with the program control information **276** output to generate cable headend **208** specific information to he transmitted. The integration algorithm for accomplishing this resides within the Generator subroutine described herein below.

The process program line-up subroutine **430** uses information from the MII **404** and PDEI **400** to develop a program line-up. Importance weighting algorithms and hest fit time algorithms are used to assign programs in time slots.

The process menu configurations subroutine **432** determines appropriate menu formats to he used and positions programs on menu screens. Information from the MII **404** and PDEI **400** are used to determine program positions on mcnus.

The menu display algorithms **434** displays menus as the menus would he seen hy the viewer on a large CRT or color monitor.

The editing of menus subroutine **436** works with the menu display algorithm and PDEI **400** to allow the packager to edit menus on-the-fly during viewing of the menus.

The graphical transponder allocation display **438** sends information obtained from the CFIA **404** and PDEI **400** to create graphical displays enahling the packager to comprehend the allocation of transponder space across the entire television delivery system **200**.

In a manner similar to the display and editing of menus represented at hlocks **434**, **436**, the packager may utilize the editing transponder allocation subroutine **440** to interactively reallocate assignment of transponder space. In the preferred embodiment, the EIS with yield management may he used hy the packager to assist in decisions on allocating transponder space.

The generator subroutine **442** creates the program control information signal for output. The Generator subroutine receives the cahle franchise control signal and uses this signal to help create a custom signal for each cable headend **208**.

The Packaging Routine **448** obtains and packages the programs, along with the program control information signal **216**, for transmission to the transponders.

With continued reference to FIGS. **7**, **8** and **9**, the general software flow of the operations center **202** is depicted. The flow can he hroken up into modules that apply to parts of the database to allow viewing, editing, and adding records to the database. The software also accomplishes database integrity checking hy restricting the user to enter only valid data, and by checking for conflicts.

FIG. **9** shows some of the software involved in the creation of programs, events and services. This creation occurs prior to or during the processing of the program line-up **430** shown in FIG. **8**. With reference to FIG. **9**, a first step is indicated generally at **461** and includes acquiring source materials for program production at the Operations Center **202** (e.g., tape production). Once the source materials are collected **460**, and entered into the database "D", they can be used to create programs **462**. These programs are made up of source 'cuts' from various video/audio source materials. Once the programs have been generated and entered into the database "D", events, collections of one or more programs, are created **464**. Each event is then schedule onto a service **466**, with the software checking for conflicts. Each service is given run times, and days, and checked for conflicts. Once the services and events have been created, the event names can he added to the menus **468**. The programs for the events and services may he stored at the Operations Center (as shown in FIG. **11** at **286**). Processing and manipulation of the events or records is depicted generally at **463**.

The packager user interface (a portion of **463**) for each of the creation modules works substantially identically to each of the other modules to make the interface easy to use and learn. The packager user interfaces forms a portion of the PDEI **400** shown on FIG. **8**. The browse system **470** is entered first and allows viewing of records, and selection of specific records. The database can he 'populated' hy selection of a hutton, which activates a populate screen. As represented at hlock **471**, this allows details to he deleted, added or changed for events, programs, and sources. The browse screen also allows access to the edit screen **472**, where fields in a selected record can he modified, with conflicts or errors, in scheduling for example, being checked continuously, as at **473** and **474**.

In use, the Operations Center **202** of the present invention performs a variety of management functions which can he hroken out into five primary areas: (1) cable headend **208** management, (2) program source management, (3) hroadcast program management, (4) internal program storage and management, and (5) marketing, management and customer information. A relational database, such as that represented hy FIG. **10**, can he used to maintain the data associated with these areas.

Customer hilling is not included in any of the above five areas for the Operations Center **202**. Although hilling can be handled hy the Operations Center **202** (as shown in the database structure **508**, **511**), it is preferred that hilling is handled at a remote location through traditional channels and methods (such as Cable TV hilling provided hy Telecorp corporation). Extracts of customer purchases will he provided to the Operations Center **202**. These extracts of information will he formatted and correlated with customer demographics for marketing purposes hy the Marketing Information Interface (MII) **402**.

(1) Cable Headend Management

Management of the cahle headend **208** includes the following activities: defining the cable headend site; profiling

the viewers; determining available set top equipment; defining the concatenated cable systems connected to the cable headend site. This information may be stored as cable franchise information within the Operations Center **202** database by the Cable Franchise Information Access routine **404**. Such information can be compiled and maintained in a relational database (described below and shown as **328** in FIG. **11**).

(2) Program Source Management

Source programs will be provided by a variety of networks. Information from the contractual records to the actual program tapes should be maintained and includes: tracking of property rights; tracking and profiling source tapes; profiling source providers. A relational database (such as "D" shown in FIG. 9) can be used, for example, that identifies and correlates programs sources. Programs may be received from various rights holders, and such a database would track the person or entity that owns the rights to each program at issue. Other data could be maintained relating to program cuts (a program cut is a portion of a program) that specifies, for example, the program from which the cut is taken. Information relating to time slot allocations, menu entries, and categories, and channel assignments are also maintained in the relational database.

Program services represents a purchasable time slice which is occupied by a type of programming. Each time slice has multiple time constraints. Using the purchasing of through time slices allows for great flexibility. An infinite number of program and time slice combinations are possible. Preferably, services are created using the software shown in FIG. **9**, particularly the service creation routine **466**. For a service to become available at a cable headend **208** site, it is mapped to the site. At the time of mapping the program service is assigned a program channel.

Program services are defined by the following fields:

Service ID

System generated unique ID

Description	Describes the service. The description will allow the packager to easily assign a service to a broadcast program.
Type	Defines the type of service. Current service types include YCTV ™, Grid, Network and Other.
Network ID	Relevant for network services. (examples: ABC, NBC, DISC ™)
Broadcast Event	Relevant for a YCTV ™ service. Identifies the current YCTV ™ broadcast event assigned to the service.
PICON File	Name of the picture icon (PICON) assigned to the service. This picon is displayed for example on the buy screen for a pay per view event.
Expiration Date	Expiration date of the service. Removes the service from the service selection list.
Day Start	Each service is a series of days within a week. This represents the starting day. (example: Monday)
Day Stop	Represents the last day in the interval.
Time Start	Within a day, the service has a time period. This field represents the start of the period.
Time Stop	Represents the end of the time period.
Required Tape	If stored tapes are required, the number of tapes required by the service.

(3) Broadcast Program Management

Broadcast program management is one focal point of the data management system. The issues of product, price, promotion and packaging are addressed at this level. Decisions in these areas will affect the actual programming that will be shown to the viewers. Information on description of the content of each program event, program scheduling, broadcast program pricing, TV/set top information flow and information on how broadcast programs will be mapped to viewer channels should be included in the database. Preferably, the EIS system described below will access this data and assist in the Broadcast Program Management.

(4) Internal Program Management

Information on internally stored programs at the Operations Center **202** should also be maintained. This will allow the Operations Center **202** to assemble electronically stored programs, CD stored programs and program tapes, and ensure the quality of programs and location of programs.

(5) Marketing And Customer Information

Last, and important, marketing and customer information should be maintained. In order to effectively manage the operations, information is constantly needed on market conditions. Information is needed on the existence of markets for certain programs. The following type of information must be maintained in a Marketing and Customer Information data base: demographic profile of viewers, viewer buy information; correlation of demographic information with buy information, information rapid restructuring of program mix in response to data analysis. As a subscriber uses the system, this viewer information or viewer log data can be stored and maintained in relational database. The Marketing Information Interface **402** gathers the marketing information and indexes the information for inclusion in the Marketing and Customer Information database. An example of the type of information that is needed in this data base is a viewer profile.

The viewer profile data fields are an example of typical fields required in the databases. Definitions of various fields are listed below. The primary purpose of profiling the viewer is to acquire marketing information on the viewer's response to available selections. Ancillary information will be available including the actual program and channel selections of the viewer. Information tracked within the viewer's profile includes:

Viewer ID	A unique identifier generated by the system.
Set-Top Types	Boolean field which identifies the type of set top used.
Headend ID	Links the viewer to a particular cable site.
Site Assigned ID	Viewer ID assigned by the cable site.
Set-Top ID	ID of the viewer's set top.
Hookup Date	Date physical hardware is connected.
Survey Date	A demographic profile will be conducted on each user. The following fields represent this demographic information. The data represents when the interview survey was completed.
Viewers Age 2–5	Boolean field if the household has viewers between 2 and 5 years of age.
Viewers Age 6–11	Boolean field if the household has viewers between 6 and 11 years of age.
Viewers Age 12–17	Boolean field if the household has viewers between 12 and 17 years of age.
Tape Rental $	Approximate amount spent on tape rentals on a monthly basis.

-continued

PPV $	Household average pay-pre-view expenditures per month.
Income	Annual household income.
Zip Code	Self-explanatory.
Cable Tier	Level of cable service purchased.
Number of TV's	Self-Explanatory.
Years with Cable	Self-Explanatory.
Occupancy	Number of people in household.
Highest Education	Highest level of education of any member of the household.

The compilation of viewer demographic information has an impact on decisions based on marketing. The names of the heads of household are not used due to Privacy Act considerations. Completion of demographic data can be accomplished referencing the cahle site assigned ID or the system generated ID. There are numerous variations to the field definitions listed above such as different age groupings.

To maintain the database at the Operations Center **202**, a data hase server, communications server, user work station or stations **262**, or the suitahle equivalent thereof, are needed. The database server performs the following functions: it is the repository for data hase files, event logging, event scheduling (example, automated download of files to headends **208**), multi-user services, data hase server services, and data base security access.

The communications server performs the following functions on data hase data: integrity check, filtering, processing, downloading to headends **208**, uploading from headends **208**, and uploading from remote location.

User work stations **262** perform the following tasks: creation, deletion and access of all database data, system administration and report generation. Database manipulations are performed through the user workstations or remotely. The database structure is designed to support multiple users performing multiple tasks simultaneously. The preferred emhodiment includes a network of user workstations **262**. The workstations **262**, through user interface software, access data within database files on the database server.

For example, once the appropriate database data has been generated for downloading to a cahle headend **208**, the communications server is instructed to perform the download. Although this may be done manually at the communications scrver, it is preferred that the communications server automatically send information to the cable headends **208**. The communications server retrieves required data from the database server, filters out any data not associated with the specified headend **208**, and performs data integrity checks, creates data files to be downloaded and then downloads the data file via modem (or other means such as the DCPU **270**). While the communication server is connected with the headend **208**, it also requests any data that the headend might he holding for the Operations Center **202**. This may consist of cahle headend **208** event log information, set top hilling and viewer log data on programs watched, etc.

The communications server may also assist in retrieving information from other remote sites such as remote billing and statistic sites. For example, if a location is heing used for hilling purposes, the communications server may retrieve viewer log data. Also, the communications server may retrieve billing and viewer log data from actual set top converters in the field. Once the data is retrieved it is sent to the database server. Thus, in the preferred emhodiment the communications server will support incoming information via modem or otherwise.

The hasic database structure at the Operations Center **202** consists of multiple tahles. Database data tahles contain one or more data records, each with multiple fields. Each field contains a piece of data about the particular record. This data may be general information, such as a numeric value, date or text string, or it may he a reference to another database record relating one piece of data to another. Database index files contain information about associated data files to allow for improved data retrieval. The database index file makes retrieval of information much quicker.

In an alternative emhodiment where some television programming begins with the procurement of source material in the form of tapes or CDs, additional data about the tapes or CDs may be stored in the Operations Center database. Each tape or CD may have a database record associated with it, source tape data file. Each tape may contain multiple cuts of which each cut has an associated record in a source tape detailed data file. Additionally, a company data file may contain individual records for the rights of the holders of the source tapes as well as company information about cahle headends **208**. In this alternative emhodiment with tapes, programs may he created from multiple tapes using multiple tape source cuts. The programs created by these source cuts may be stored and the individual cuts that make up the programs may be stored in a database record called "program tape detail." Events may he created that consist of more than one program and details on individual programs that make up these events may he stored in a database file called "event detail." Using this emhodiment, events may be sold to subscribers.

FIG. **10** and the description below is a more complete example of a database structure that can he used with the present invention. Each database file is listed below along with a description, record field details and explanation of relationships. The software data structures are defined after the description of the database structure.

The SCHEDULE Database file **501** contains scheduling data for a single day. There are many schedule files, one for each day of schedule information. The actual filename for a given days schedule is assigned under computer control. Schedules are hroken up into single days so they may he easily created, dispatched and archived. A cross-reference of days to computer generated filenames is kept. Each scheduled event (either a program or a preview) has its own record entry and unique schedule ID This record references the corresponding scheduled program or preview and program type (either program or preview). The service to carry the scheduled program is also referenced. The starting date and time is also specified. Program duration is stored as a program attribute and is not included here. Note that program, preview and service records must he provisioned before they may be referenced in a schedule record.

Another SCHEDULE Database file **500** contains a cross-reference of starting dates data to computer generated filenames.

The PROGRAM Database file **502** contains Program records are contained in another database file **502**, with each record representing a source program. Each program has a unique program ID. If the program has a corresponding preview, it is also referenced. Program category and price are also referenced. The structure of the program category database may be modified if multiple categories per program are desired. Program name, description and duration are also given. Note that preview, program category and price category records must he provisioned hefore they may he referenced in a program record.

The SERVICE Database file **503** contains service records with each record representing an availahle service. A service

may he thought of as a virtual video channel. Virtual channels are non-existent channels which are mapped or created by hardware and software and is described in co-pending patent application Ser. No. 08/160,194, filed Dec. 2, 1998, entitled ADVANCED SET TOP TERMINAL FOR A CABLE TELEVISION DELIVERY SYSTEM, incorporated herein by reference. Services are then mapped into local headend channels. Since initial distribution of video source material may he hy "Federal Express" instead of a video channel, a service ID is used to identify the virtual channel heing used for the desired service. "60 Minutes" could he distributed and then be mapped into any desired local headend channel. The service database exists at hoth the national site and at each local headend **208**. Every service has a name, call letters and a description of the service. Every service also has an assigned local channel, "A" tape (or CD) machine ID and "B" tape (or CD) machine ID. Note that these last three parameters only apply to the service databases at the local headends **208**. The local headend service database performs an equivalent function of a "channel map." For a further description of the cable headend function, see co-pending patent application Ser. No. 08/160,280, filed Dec. 2, 1993, entitled NETWORK CONTROLLER FOR A CABLE TELEVISION DELIVERY SYSTEM, filed hy the same assignee.

The PREVIEW Database file **504** contains preview records with each record representing a source preview. A preview is like a program that is scheduled and distributed over a service. It differs from a program in that multiple previews may be distrihuted over the same service at the same time. Also, previews are free. Each preview specifies its location on the TV screen. This is generally done hy selecting from a menu of valid screen positions. Unlike programs, previews do not reference program and price categories or other previews.

The PROGRAM CATEGORY Database file **505** contains program category records with each record representing a valid program category. Examples of program categories are movies, sports, educational and news. Multiple program categories per program may he accommodated if desired with simple changes to the database structure.

The PRICE CATEGORY Database file **506** contains price category records with each record representing a valid price category. Price categories are used to provide pricing consistency throughout the system. It also provides flexihility at the headend **208** to price various categories differently should this he desired. For example, distrihuted movies may be assigned the price category "movie" at the national site. Each headend **208** could then charge differing amounts for their movies hy manipulating their local price category database. If a current price structure needed to be changed, the change would he made once in the price category database instead of in each program record.

The EVENT LOG Database file **510** contains event data for a single day. There are many event files, one for each day of event information. The actual filename for a given days events is assigned under computer control. Events are hroken up into single days so they may he easily archived. A cross-reference of days to computer generated filenames is kept.

Each event record contains a unique ID, an event code, ID of the process that generated the event and date/time stamp of the event.

The EVENT LOG FILENAME Database file **507** contains a cross-reference of start date to computer generated filenames.

The VIEWER LOG Database file **512** contains viewer log data for a single day. There are many viewer log files, one for each day of viewer log information. The actual filename for a given days viewer log data is assigned under computer control. Viewer log data is hroken up into single days so it may he easily archived. A cross-reference of days to computer generated filenames is kept.

Each event record contains a unique ID, an event code, ID of the process that generated the event and date/time stamp of the event. The Marketing Information Interface **402** accesses the VIEWER LOG Database file as necessary to retrieve "program watched" information **420**.

The VIEWER LOG FILENAME Database file **509** contains a cross-reference of date to computer generated filenames.

The BILLING Database file **511** contains hilling data for a single day. There are many hilling files, one for each day of hilling information. The actual filename for a given days hilling data is assigned under computer control. Billing data is hroken up into single days so it may he easily archived. A cross-reference of days to computer generated filenames is kept.

Each event record contains a unique ID, an event code, ID of the process that generated the event and date/time stamp of the event.

The BILLING FILENAME Database file **508** contains a cross-reference of start date to computer generated filenames.

The NEWS FILENAME Database file **509** contains a cross-reference of date to computer generated filenames.

The SET TOP Database file **517** contains set top converter records with each record representing a unique set top converter. Each set top is assigned to a headend **208**. Set-top type, software version and serial number is also stored. Note that headend records must he provisioned hefore they may he referenced in a set top record.

The HEAD END Database file **518** contains headend records with each record containing headend **208** data specific to a single headend **208**. Each headend **208** has a name, contact name, address, phone numher, modem information, time zone (relative to GMT) and daylight savings time flag. This information may he stored in a separate database file called Cahle Franchise Configuration (shown as **328** in FIG. **11**).

The NATIONAL Database file **515** contains a single record containing national site information. This includes site name, contact, modem information, time zone and daylight savings time flag.

The CUSTOMER Database file **516** contains customer records with each record containing customer data specific to a single customer. This includes personal information (name, address, phone numher, . . .) and assigned set top converter.

The TAPE MACHINE Database file **519** contains video tape or CD machine information. Each machine is assigned a unique ID, its control port address, its A/B switch address (if present), its assigned service and an A/B assignment. This database is only located at the headends **208**.

The MESSAGE Database file **514** contains availahle system messages. They are detailed in nature and are pre-programmed. Each message has an associated function. To schedule a desired function, the appropriate message is referenced in the scheduler task list.

The TASK Database file **513** contains scheduled tasks to he performed periodically. It is used in conjunction with a scheduler process to control computer system functions such as data dispatch and retrieval, archival and database maintenance. Each task is assigned a unique ID, start time, stop time, period in minutes) and task type (single, periodic,

round-robin). Functions are actually scheduled by scheduling the appropriate message to he sent to the appropriate process. Availahle messages are kept in a separate database. Note that these messages must he provisioned hefore they may he referenced in a task record.

E. System Operations

FIG. **11** shows the hasic operations that must occur in order for the packaged signal to he sent to the satellite **206**. External digital **280** and analog signals **282** must he received from television programming sources and converted to a standard digital format hy a converter **284**, as described above. Also within the Operations Center **202**, stored programs **286** must he accessed using hanks of looping tape machines or other video storage/retrieval devices, either analog or digital, and converted to a standard digital format hy the converter **284** prior to use by the CAP **260**.

The programmer or program packager utilizing the CAP **260** must input a variety of information, including program information, in order to allow the CAP **260** to perform its function of generating program control information and packaging programs. Some of the information required by the CAP **260** are the date, time slots and program categories desired by the television programmer.

The CAP **260** system includes one or more CPUs and one or more programmer/packager consoles, together identified in FIG. **4** as workstations **262**. In the preferred embodiment, each packager console includes one or more CRT screens, a keyboard, a mouse (or cursor movement), and standard video editing equipment. In large Operations Centers **202**, multiple packager consoles **262** may be needed for the CAP **260**.

As shown in FIG. **12**, the first step in the operation of the CAP **260** is selecting the type of programming **300** which will be packaged. Basically there are six hroad categories in which most television programming can be classified: static programming **302**, interactive services **304**, pay per view **306**, live sports specials **308**, mini pays **310**, and data services **312**. Static programs are programs which will show repetitively over a period of time such as a day or week. Static programs include movies showing repetitively on movie channels, children's programs, documentaries, news, entertainment. Program services, with defined start and end time periods, hehave like static programs and may he handled in a similar manner.

Interactive services **304** typically include interactive programs using the Vertical Blanking Interval (VBI) or other data streams synchronized with the programming to communicate interactive features (such as those used in education), and games. Using this feature, interactive home shopping programs are possihle. Pay per view **306** are programs which are individually ordered hy the subscriber. After ordering, the subscriher is authorized to access the program for a limited time, (e.g. three hours, two days, etc.). Live sports specials are live events usually related to sports which subscribers are unlikely to watch on taped delay.

Mini pays **310** are channels to which existing set top converter boxes (not shown) and the set top terminals **220** of the present invention may subscribe. The subscriptions for mini pays **310** may he daily, weekly, or monthly. An example would he the Science Fiction channel. Data services **312** are services in which information is interactively presented to the subscriber using a modem or other high rate of speed data transfer. Some examples are Prodigy, services for airline reservations, and TV guide services (e.g. TV Guide X*PRESS™, InSight™, etc.). Data could also include classified or other forms of advertising.

The packager begins the CAP processing using the Packager Data Entry Interface Software **400** and a workstation **262**. After selecting the type of programming, the packager must identify a pool of programs (within a category) to he packaged. The next CAP step varies for different program categories. For the category of live sports **308**, additional program interstitial elements **314** such as promos and other sports news may be added hefore further processing. For the live sports **308**, static (or program service) **302**, interactive services **304** and pay per view **306** categories, the next CAP **260** step is for one television program to he selected **316**. This is followed hy each program individually being assigned dates to he played, a start date (for continuous play) and start times **318**. Many dates and start times may he assigned to any given program. Using this methodology, programs may he purchased hy viewers in time slices (e.g., one week). The program information for these categories may then he processed for allocation of transponder space and setting of prices, as indicated at hlocks **320**, **322**, respectively.

Mini pays **310** and data services **312** require less processing hy the CAP **260**. After identifying the mini pays **310**, the CAP **260** may proceed to allocation of transponder space and pricing, hlock **320**, for the mini pays **310**. Data services in the preferred embodiment generally do not require allocation of transponder space and generally do not require price setting. The information for data services **312** may he directly processed for menu configuration, block **324**. In alternate emhodiments, the data services **312** may be processed through these portions of the CAP **260** program.

The CAP **260** uses an interactive algorithm **416** to allocate transponder space **320** and set prices **322**. The factors weighed by the algorithm are: 1. huy rates of the program, 2. margin of profit on the program, 3. length of the program, 4. any contractual requirement which overrides other factors (such as requirement to run a specific footlall game live in its entirety). The information on buy rates of the program may be obtained hy the Marketing Information Interface **400** from a Central Statistical and Billing Site, a Regional Statistical and Billing Site, the cahle headend **208** or directly from the set top terminals **220** as will he described later. The CAP **260** must consider the priority levels of programming (e.g., FIG. **16**) when allocating transponder space. Particularly, as in the preferred emhodiment, transponders are assigned to three specific priority levels. The CAP may automatically (without packager intervention) access the MII **400** and the EIS to obtain necessary decision making information on transponder allocation.

Following transponder allocation and price setting **320**, **322**, respectively, the CAP **260** proceeds to menu configuration **324**. The positioning of programs within the menu configuration **324** can have an effect on subscriber buy rates for the program. (The processing of menu configurations **432** is also described in reference to FIG. **8**.) Therefore, an algorithm accounting for either a manually assigned program importance or a calculated weight of the program importance is used to determine each programs position within the menu scheme. For instance, a popular program with a high profit margin may he assigned a high weight of importance and shown in a prominent place in the menu scheme. Alternatively, a high profit program with sagging sales may be manually assigned a prominent place in the program schedule to increase sales.

After a series of entries hy the programmer/packager at the Operations Center **202**, the CAP **260** displays draft menus **434** or schedules (including priority levels) for programming. The packager may now manipulate the menus and schedules and make changes as necessary **436**. After each change, the packager may again display the menus or

schedules and determine if any more changes are necessary **436**. The packager may use the Executive Information System with yield management as described below to assist in editing the menus and schedules. When the packager is satisfied with the menu configuration **324** and scheduling of television programs, the packager may then instruct the CAP **260** to complete the process.

E. 1. Menu Structure

The series of menus shown in FIG. **22** is the normal or standard format for a variety of alternative embodiments to the present invention. An introductory screen upon power up that contains important messages, followed by a home menu **1010** with major programming categories is the basis upon which many alternative embodiments of the menu driven selection process can be built.

Skipping a sequence or level of the menu structure is possible and perhaps desired in certain instances. In simple alternate embodiments it is possible to combine the home menu **1010** and introductory menu **1000** into one menu that performs both functions. It will be obvious to one skilled in the art that the specific functions of the Home menu **1010** and Introductory menu **1000** may be exchanged or shared in a number of ways. It is also possible to allow a user to skip directly from the introductory menu **1000** to a submenu **1050**. This can he accomplished most easily with a separate direct access remote control **900** button. Generally, a subscriber will access a television program through execution of a submenu **1050**.

The During program menus **1200** are enacted by the set top terminal **220** only after the subscriber has selected a television program. These menus provide the subscriber with additional functionality and/or additional information while he is viewing a selected program. The During program menus **1200** sequence can be further subdivided into at least two types of menus, Hidden Menus **1380** and Program Overlay Menus **1390**.

To avoid disturbing a subscriber during viewing of a program, the Hidden Menus **1380** are not shown to the subscriber but instead "reside" at the set top terminal **220** microprocessor. The Hidden Menus **1380** do not effect the selected program audio. The microprocessor awaits a button entry either from the remote **900** or set top terminal **220** buttons before executing or displaying any Hidden Menu options. The Hidden Menus **1380** provide the subscriber with additional functions such as entering an interactive mode or escaping from a selected program.

Program Overlay Menus **1390** are similar to Hidden Menus **1380** in that they occur during a program. However, the Program Overlay Menus **1390** are overlayed onto portions of the television screen and not hidden. The Program Overlay Menus **1390** allow the subscriber to continue to watch the selected television program with audio but place additional information on portions of the television screen. Most overlays cover small portions of the screen allowing the subscriber to continue to comfortably view his program selection. Other Overlays which are by their nature more important than the program being viewed will overlay onto greater portions of the screen. In the preferred embodiment, some Program Overlay Menus **1390** reduce or scale down the entire programs video screen and redirect the video to a portion of the screen.

All menu entries may be made either from buttons available on the top cover of the set top terminal **220** or from the remote **900**.

FIG. **23***a* shows the preferred embodiment for subscriber selection of television programming. FIG. **23***b* shows additional major menu **1020** categories, **1042**, **1044**, **1046**, **1048**, which may used with the invention. Again, the introductory menu **1000** followed by the home menu **1010** is the preferred sequence of on-screen displays. In the preferred embodiment shown in **23***a*, the home menu **1010** provides a choice of ten major menus **1022**, **1024**, **1026**, **1028**, **1030**, **1032**, **1034**, **1036**, **1038**, **1040**. Upon selection of a major menu **1020** category from the home menu **1010**, the program proceeds to a major menu **1020** offering further viewer selections. Each major menu **1020** is customized to target the expected viewership. Depending on the number of available program choices the major menus **1020** either breakdown the major category into sub-categories or provide the subscriber with access to further information on a particular program.

For example, the major menu **1020** for children's programming provides a list of subcategories **1052** from which the subscriber selects. Upon selection of a subcategory a submenu **1054**, **1056** listing program choices within that sub-category is shown to the subscriber. Upon selection of a particular programming choice within the first submenu **1050**, the subscriber is then provided with a second submenu **1058** describing the program that the subscriber has selected. From this menu, the subscriber may now confirm his program choice and receive a confirmation submenu **1060** from the set top terminal **220** software.

Since the system utilizes digital signals in compressed format, High Definition Television programming can also be accommodated through the menu system. In addition, since the set top terminal **220** has two way communication with the cable headend, interactive television programming is possible, with return signals generated by the set top terminal **220**. Similarly, the system can support "movies on demand" where a subscriber communicates through the set top terminal **220** with an automated facility to order movies stored at the facility.

Using this on-screen menu approach to program selection, there is nearly an unlimited number of menus that can be shown to the subscriber. The memory capability of the set top terminal **220** and the quantity of information that is sent via the program control information signal are the only limits on the number of menus and amount of information that can be displayed to the subscriber. The approach of using a series of menus in a simple tree sequence is both easy for the subscriber to use and simply implemented by the set top terminal **220** and remote control device **900** with cursor movement. A user interface software programmer will find many obvious variations from the preferred embodiment shown.

FIGS. **24***a* and **24***b* show examples of introductory menu screens that are displayed on the subscriber's television. FIG. **24***a*, the preferred embodiment, welcomes the subscriber to the cable system and offers the subscriber three options. The subscriber may choose regular cable television (channels 2 through 39), programs on demand (e.g., movies), or instructions on the use of the remote control **900**. Other basic program options are possible on the introductory menu screen **1000**. For example, instead of, or in addition to, the remote control **900** instructions, a system "help" feature can he offered on the introductory menu **1000**.

FIG. **24***b* shows an alternate embodiment for the introductory menu screen **1000**. In the upper left-hand corner of the menu, there is a small window **1002** that may be customized to the subscriber. A subscriber will be given the option of showing the current time in this window. In the upper right-hand corner a second customized window **1004** is available in which a subscriber may show the day and date. These windows may be easily customized for subscrib-

ers to show military time, European date, phase of the moon, quote of the day, or other informational messages. These windows may be customized by subscribers using on-screen menu displays following the introductory menu **1000**.

In the preferred embodiment, the subscriber is given the capability of accessing base channels such as regular broadcast TV and standard cable channels directly from the introductory menu **1000** by entering the channel number. The subscriber is also given the capability of directly accessing his account with the cable company. Further, in the preferred embodiment, the subscriber may directly access a major menu **1020** and bypass the home menu screen **1010**. If the subscriber is familiar with the programming choices available on the major menus **1020**, he may select an icon button **960**, or a lettered key (alpha key) from his remote control **900** and directly access the desired major menu **1020**. If any key entry other than those expected by the set top terminal **220** software program is made, the home menu **1010** is placed on the television screen. In addition, after a period of time if no selections are made from the introductory menu **1000**, the program may default to the home menu screen **1010**.

FIGS. **25***a*, **25***b*, **25***c*, and **25***d* are examples of home menus **1010** that may be used in the set top terminal **220** software. FIGS. **25***a*–**25***d* all employ multiple window techniques to make the menu user friendly and offer a significant number of choices. It is preferred that a channel line up and the major menu **1020** categories both appear on the home menu **1010**.

FIG. **25***a*, the preferred home menu **1010** embodiment, displays both the standard channel line up and the programming on demand icons for selection by the subscriber. FIG. **25***a* also shows various levels of subscription programming, including a "Basic" cable package and a "Basic Plus" package. Each of the choices of subscription programming preferably is assigned a different color. This increases the user friendliness of the present invention.

In FIGS. **25***b*–**25***d*, the left half of the screen is used to list the channel number and network abbreviation of the most popularly watched networks. The right half of the screen offers access to a variety of major menus **1020** listed by category names.

FIG. **25***b* shows an embodiment in which only eight major menus **1020** are utilized. By pressing the alpha-numeric or icon key **960** corresponding to the category of programs the subscriber desires, the appropriate major menu **1020** is accessed. In addition, the subscriber may employ an on-screen cursor to select any option shown in the menu. To move the cursor, the subscriber may use either the cursor movement keys on the remote control **900** or similar keys located at the top of the set top terminal **220**.

FIG. **25***c* shows how additional major menus **1020** can be displayed on the home menu screen **1010**. When there is no longer room available for additional major menu **1020** choices on the home screen, the subscriber may access a second screen of the home menu **1010**. For example, in FIG. **25***c*, if additional major menus **1020** "J" through "Z" existed, the subscriber would access those menus by highlighting and selecting the J through Z menu option (or press the J–Z on his remote **900**). After selecting J through Z, the second or extended home menu screen **1010** would appear on a subscriber's television set. This menu would then list options J through Z separately by name. Theoretically, the home menu **1010** may have many extended home menu screens. However, any more than a few extended home menu screens would confuse the average subscriber.

The home menu **1010** of FIG. **25***d* adds an additional feature at the bottom of the television screen **1011**. This option allows a subscriber to see only those program selections that are available on broadcast television. FIGS. **25***a*–*d* are but a few of the numerous variations available for the home menu **1010**.

Additionally, as shown in FIG. **26**, in an alternate embodiment, the home menu **1010** (or menu which would normally follow the introductory menu **1000**) can be simply the standard cable channel line-up. Offering the standard cable line-up on a separate menu may make selection easier for viewers with small television screens.

FIGS. **27***a* and **27***b* are examples of major menus **1020**. In particular, FIGS. **27***a* and **27***b* show a major menu **1040** whose category is hit movies.

The hit movie category is a list of recently released movies which have been found to be popular among movie goers. This movie list is changed once or twice a week to keep in line with new movie releases. Again, multi-window and customized window techniques are utilized to make the menu as user friendly as possible.

FIG. **27***a* shows the preferred embodiment of the hit movies menu **1040**. The hit movies menu icon along with the hit movies category letter A are displayed. The current date and time are displayed at the top of the screen over a menu background. Ten movie selections are displayed in the center of the screen **1009**, each in a box which may be highlighted when selected. In the lower left part of the screen, a logo window **1512** is available as well as two other option choices **1011**, Movie Library and Return to Cable TV. In an alternate embodiment, the return to Cable TV option is changed to return to the Home menu **1010** (or return to other viewing choices).

In FIG. **27***b*, the left upper window **1002** displays current time and the right upper window **1004** displays a message. This menu provides a list of eight movie titles and their rating **1009**. If the subscriber desires further information on any particular movie he may select a movie using the cursor movement buttons and press the "go" button on the remote control **900** or set top terminal **220** box.

It is important in creating user friendly interfaces that the menus are consistent and follow a pattern. A manner of making the menus is discussed below with respect to FIGS. **55** and **56**. This consistency or pattern between the different menus provides a level of comfort to the subscriber when encountering new menus. In the major menu **1020** example of FIG. **27***a*, the upper sash **1502** and lower sash **1504** remain consistent throughout menus in the preferred embodiment. The logos **1508**, icons **1510** and titles also remain consistent in the same locations.

In the major menu **1020** example of FIG. **27***b*, the customized windows **1002**, **1004** in the upper corners remain constant from menu to menu. Also, the name of the menu and category are at the top and center of the menu screen **1039**. To make the menu aesthetically pleasing, the instructions are given across the center of the screen and choices in large legible type are provided. Additionally, at the bottom of most menu screens **1011**, the subscriber is given the option of returning to regular TV or returning to the home menu **1010**.

FIGS. **27***c*–**27***g* show alternative embodiments of major menus **1020** for the home menu shown in FIG. **25***a*. FIGS. **27***c*–**27***g* show various major menus directed to the type of subscription services available (basic service **1420**, basic plus **1422**, economy package **1424**, ala carte and premium channels **1426**). These menus also provide promotional or advertising information, for example, the cost for the particular subscription service. FIG. **27***g* shows a major menu for the Learning Channel **1428**, one of the individual channels shown in the home menu of FIG. **25***a*.

These menus may be grouped in similar colors or shades of colors. For example, the basic subscription service could have a light pink color. As the subscription services increase in terms of the number of channels available, the color shading may increase correspondingly. Therefore, the premium subscription service (ala carte service) would have a dark red color, contrasting with the light pink color of the basic subscription service.

In FIG. **27***b*, the movie titled Terminator Four is highlighted, signifying that the subscriber has chosen this program option from the hit movie major menu. FIGS. **28***a* and **28***b* show submenus **1050** which would follow the selection of Terminator Four on the hit movie major menu. In FIG. **28***a*, the sash across the top of the screen **1502** remains constant from major menu **1020** to program description submenu **1050**. Again in FIG. **28***b*, for the comfort of the subscriber, the left upper window **1002** remains the same and shows the current time. The upper right-hand corner **1004** carries a message stating the next start time for the movie selected.

E. 2. Notification

FIGS. **29***a* and **29***b* are notification submenus informing the user that his program selection is about to begin (e.g., counting down until start time). Using this submenu, the set top terminal **220** warns the user prior to switching him away from the channel he is viewing to a prior selected program channel. This notification submenu is provided to the subscriber approximately one or more minutes before the set top terminal **220** changes the viewing channel.

Both notification submenu examples allow the subscriber to cancel his movie order. In FIG. **29***a*, the subscriber is notified in the center of the screen that he may cancel within the first five minutes. In FIG. **29***b* the subscriber may press escape to cancel his order without charge. The notification submenu of FIG. **29***b* informs the user of the start time at the upper right portion of the screen.

The notification submenu of FIG. **29***b* is a simple three-window menu. A strip window at the top of the screen **1103** notifies the subscriber of the movie selected and the amount of time before the movie will begin. The center window is a large video window **1556** for displaying a scene from the movie. At the bottom of the screen the submenu carries another strip menu **1105** which informs the user that he may escape from his program selection without charge.

Using a notification submenu **1127**, the set top terminal **220** may allow a subscriber to view other programs prior to his movie start time. The subscriber is amply notified of the start time of his program and effortlessly moved to the correct channel to view his selected program. This notification-type submenu may be used to move a subscriber from his current channel to any preselected channel for viewing a program which has been ordered at an earlier time. In the preferred embodiment, the amount of time provided by the notification submenu may be customized by the subscriber to a length of his preference. The notification submenu also allows a subscriber to cancel or escape from his previously selected program choice and avoid any charges. If a subscriber cancels or escapes he is returned to the channel that he is currently watching.

E. 3. Escape Time Expired

As shown in FIG. **30***a*, in the preferred embodiment, the subscriber is given a During Program Menu, specifically an Overlay menu **1130** to inform him when his five minutes of movie escape time have expired. Once the time has expired the subscriber will be billed for the movie selection.

E. 4. Escape after Charged

FIG. **30***b* is an overlay menu **1133** warning the user that he is escaping a program after being charged for the order of that program. The warning overlay menu **1133** of FIG. **30***b* follows in sequence and is prompted by a hidden menu which constantly monitors for subscriber input during viewing of the program. The hit movie hidden menu (not shown) specifically waits for certain key entries by the subscriber. In particular, the hit movie hidden menu awaits for a key stroke such as escape, cancel or an icon selection. If the escape button is depressed during the viewing of a hit movie the overlay menu of FIG. **30***a* or FIG. **30***b* will be shown. A strip menu in the lower sash of FIG. **30***b* allows the subscriber to resume full screen viewing of the hit movie.

FIG. **30***b* is a representative example of an overlay menu **1133**. It has a dark lower background sash and a light colored informational sash. The upper portion of the screen continues to display the video of the program selected. FIG. **30***c* is a reentry to ordered selection submenu **1135** for the hit movie category. The reentry to ordered selection submenus appear whenever a subscriber selects a programming option (program, event, or subscription channel), that the subscriber has already ordered. This menu has a program title window with a text title entry, and a description of the order that has already been placed for the program (or channel). In the preferred embodiment, the submenus which allow reentry to ordered selection provide the subscriber with the added option of joining the program within any fifteen minute interval. This special feature of the preferred embodiment allows a subscriber who has viewed one-half of a particular program to rejoin the program at the half-way point. In this manner, the program delivery system mimics a VCR tape recording of the program. For example, if a subscriber had rented a videotape of the movie Terminator **4** and had watched thirty minutes of the movie, he would have left his videotape in the thirty minute position.

E. 5. Reenter Program

With the menu of FIG. **30***c* a subscriber to the system who has watched thirty minutes of Terminator **4** may reenter the Terminator movie at the thirty-one to forty-five minute interval as shown in FIG. **30***c*. The nine-fifteen minute blocks of the menu display blocks are representative of the choices available for a two-hour hit movie. Other variations are possible depending on the length of the movie and the timing intervals desired.

E. 6. HDTV Promotion

FIGS. **31***a* and *3b* relate to HDTV. FIG. **31***a* is an example of a menu **1032** advertising a new feature of the system. Promotional menus, such as FIG. *3a*, may be dispersed throughout the menu driven program selection system. This particular menu describes the HDTV feature and explains its unavailability until a future date. FIG. **31***b* shows the integration of HDTV services into the menu driven program delivery system. If the subscriber selects the major menu for HDTV, he will either receive a description of the service with a suggestion to order the system, or a text note that he is a current subscriber and a listing of the currently available program selections in HDTV **1232**. If the subscriber has not paid to join the particular service, HDTV, he may be allowed to join one of the programs in progress for a limited time as a demo to entice the subscriber to order.

If the subscriber has paid his HDTV fees, a subscriber proceeds as he would in any other major menu screen.

This particular major menu shows an example of how a follow-on or second screen may exist for the same menu. In this particular case, a second screen exists for the major menu HDTV **1032**. The subscriber may access the second screen **1232** by selecting the last menu display block in the lower part of the screen "Other HDTV Selections". Following this selection, the subscriber will be given a second

screen of program selections. In this manner, any menu can have multiple screens with many program choices. This type of screen pagination on one menu allows the packager to avoid categorizing program selections within that same menu. In an alternative embodiment, the options available to the subscriber may be scrolled on one menu screen with the text within the menu display blocks changing as the subscriber scrolls up or scrolls down.

E. 7. Programs Available

In the preferred embodiment, TV guide services, listing programs available on network schedules, will be available on a major menu, as shown in FIG. **32***a*. In the preferred embodiment, the major TV guide menu **1036** would offer submenus, such as network schedules for the next seven days, today's network schedules for the next six hours, and TV guide picks for the next seven days. If the particular set top terminal **220** has been subscribed to the TV guide service, the subscriber may proceed to a submenu showing schedules of programs. If the subscriber chooses the network schedule submenu **1236**, he is offered a list of network schedules to choose from as shown in FIG. **32***b*. If a subscriber were to choose, for instance, HBO, the submenu **1238** shown in FIG. **32***c* would appear. This submenu allows a subscriber to choose the program date that interests him. Following selection of a date, the subscriber is shown a more specific submenu **1242** listing programs available on the particular date as shown in **32***d*.

Following a program choice, a program description submenu **1244** is placed on the television screen as shown in FIG. **32***e*. In addition, from this program description submenu, the viewer may choose to record the selected program on his VCR using the guide record feature. If the guide record feature is chosen, the guide record submenu **1248** shown in FIG. **32***f* provides the subscriber with further instructions. In order for the set top terminal **220** to perform the guide record functions and operate the VCR, control signals must be sent from the set top terminal **220** to the VCR via the video connection **650** or via a separate connection between the set top terminal **220** and the VCR. The VCR must be capable of interpreting these control signals from the set top terminal **220** and performing the desired function (such as, activating the record feature). In the preferred embodiment, the VCR control signals are sent with the video signal and output from the output **650**, as described above.

FIGS. **32***g* and **32***h* refer to the broadcast TV menu option available in FIG. **23***b*. FIG. **32***g* is a major menu **1046** displaying subcategories of programs available on a group of channels called generically "broadcast TV." For each subcategory there is a separate submenu listing programs that are available in the particular subcategory on a group of channels called broadcast TV.

By using the broadcast TV menu, the subscriber does not need a written guide of available television programming on the major networks. Although the preferred embodiment categorizes television programs available on the major networks, a simple chronological listing of programs may also be used.

Following a subcategory selection on the broadcast TV menu such as favorite channels, the set top terminal **220** will display a submenu of programs as shown in FIG. **32***i*. The favorite channel program menu **1256** of FIG. **32***h* allows the subscriber to choose among eight programs in progress at 9:45 p.m. on a broadcast TV network.

Using this methodology, the subscriber may also be allowed to choose among television programs which will be available for viewing in the next half hour or hour. When the time of the preselected program is approaching, the set top terminal **220** will display a notification menu or window to the subscriber (similar to FIG. **29***a* and **29***b*) informing him of an eminent change of channels to a previously selected program.

E. 8. Mood Questions

Once a personal profile has been created (in a particular set top terminal **220**), it can be indefinitely stored in non-volatile memory. A selection at the home menu screen **1010** activates the program selection feature. Following activation of the feature, the set top terminal **220** will present the viewer with a series of brief questions to determine the viewer's mood at that particular time. For example, the first mood question screen **1260** may ask the viewer to select whether he desires a short (30 minute), medium (30–60 minute), or long (60 plus minute) program selection, as shown in FIG. **32***i*. The second mood question screen **1262** requests the viewer to select between a serious program, a thoughtful program, or a light program, as shown in FIG. **32***j*. And the third mood question screen **1264** requests whether the user desires a passive program or an active program, as shown in FIG. **32***k*. The viewer makes his selection in each question menu utilizing the cursor movement keys and "go" button on his remote control **900**. A variety of other mood questions are possible such as fatigue level of the viewer.

After the viewer has responded to the mood question menus which determine his mood, the set top terminal **220** finds the best programming matches for the viewer and displays an offering of several suggested programs to the viewer (three or more programs are preferred). The matching algorithm compares the viewer profile data with information about the program derived from the program control information (or STTCIS) signal, such as show category, description type, length, etc. Using the personal profile information and mood questions suggested above, the following types of outcomes are possible. If the set top terminal **220** is presented with a young lady viewer, educated in Boston who watches sitcoms on a regular basis, and desires a short, light, passive program, a match might be found with the 30-minute sitcom Cheers, the sitcom Designing Women, and Murphy Brown. Taking another example, a middle-aged male viewer from the Boston area, wishing a longer length, light, passive program suggestion might be suggested the New England Patriots game, the Boston Red Sox game and a science fiction movie.

With this program selection feature, the set top terminal **220** can intelligently assist the specific viewer in selecting a television program. Instead of the set top terminal **220** requiring an input of personal profile information, the terminal may also "learn" a subscriber's viewing habits by maintaining historical data on the types of programs the viewer has most frequently watched. This information can then be fed to the matching algorithm which selects the suggested television programs.

Using this methodology, it is even possible for the set top terminal **220** to suggest programs for two viewers. By using two sets of viewer profile information, the matching algorithm can find the best match for joint viewing. For example, the set top terminal **220** can suggest programs for a couple watching television simultaneously.

E. 9. Promotions

FIGS. **33***a*, **33***b*, and **33***c* demonstrate the use of promotional menus to sell subscriptions to services in the system. In particular, FIG. **33***a* is a promotional menu **1304** for Level A interactive services. Level A interactive services offers subscribers additional information about programs such as

quizzes, geographical facts, etc. This information may he received hy the set top terminal **220** in several data formats including VBI and in tbe program control information signal. FIG. **33***b* is a promotional menu **1306** for Level B interactive services which include a variety of on-line type services sucb as Prodigy, Yellow Pages, Airline Reservations, etc.

FIG. **33***c* is a promotion menu **1308** for the Level C interactive services. The Level C interactive services utilize local storage such as CD technology to offer an enormous range of multi-media experiences. The Level C interactive services require a hardware upgrade as described earlier. Specially adopted CD-I and CD-ROM units are needed for this service.

E. 10. Level A Interactive

FIGS. **33***d* through **33***j* show menus tbat are available using the interactive Level A services. When interactive Levels A services are availahle in a television program, the system will display the interactive logo consisting of tbe letter "I" and two arrows with semicircular tails. In the preferred emhodiment tbe set top terminal **220** will place the interactive logo on the television screen as an overlay menu **1310**. In the preferred emhodiment, tbe set top terminal **220** will detect tbat there is data or information availahle about a television program which can be displayed to a subscriber using the interactive service. When the set top terminal **220** senses that there is interactive information available, it will generate the interactive logo overlay menu and place it on the television screen. For example, the set top terminal **220** will detect that information on a television program is heing sent in the vertical hlanking interval (VBI) and generate an interactive logo overlay menu wbich will appear on the subscriher's television screen for approximately fifteen seconds during each ten minute interval of programming.

When the subscriber sees the interactive logo on his television screen, be is made aware of the fact that interactive services are availahle in conjunction with his television program. If tbe subscriher presses his interactive remote control hutton, an additional overlay menu will he generated hy the set top terminal **220** and placed on the screen. This menu **1310** is shown in FIG. **33***d* heing overlayed on an interactive television program. From this menu the subscriher may select interactive features or return to tbe television program without interactive features.

If the subscriher selects interactive features be will he presented with tbe interactive Level A submenu **1312** in FIG. **33***e*. From this submenu the subscriher may cboose a variety of different types of textual interactivity with tbe current television program. Some examples are quizzes, fast facts, more info, where in tbe world, products, etc. At any time during the interactive submenus the user may return to tbe television program without interactive features.

This interactive submenu has an example of taking a complete television program video, scaling it down to a smaller size and directing the video into a video window of a submenu.

FIG. **33***f* shows an interactive fast facts submenu **1314**. In this submenu textual information is given to the subscriher in the lower half of his screen. This textual information will change as additional data is received hy tbe set top terminal **220** relating to this television program.

FIG. **33***g* shows tbe use of the subcategory "more information" in the interactive service. This submenu **1316** gives additional information related to the television program to the viewer in textual form in the lower half of tbe screen.

FIG. **33***h* is an interactive submenu **1318** for tbe subcategory "quiz." In this interactive subcategory, the user is presented with questions and a series of possihle answers. If the subscriher desires, he selects one of the answers to the quiz question. After bis selection, the set top terminal **220** sequences to another menu. The set top terminal **220** sequences to the interactive quiz answers submenu which informs the subscriher wbether he has cbosen the correct answer or not. FIG. **33***i* shows a correctly answered quiz question **1320** and FIG. **33***j* shows an incorrectly answered quiz question **1324**. In the preferred embodiment, the menu grapbics for both of tbese menus **33***i* and **33***j* is the same. The only difference is in tbe text which can he generated hy the text generator of the set top terminal **220**.

E. 11. Level B Interactive

FIG. **34***a* is an example of a submenu for Level B interactive services. From this menu screen **1330**, any of a number of on-line data services could be accessed. In FIG. **34***a*, the airline reservations selection has been selected by the subscriher.

E. 12. On-Line Data

FIGS. **34***b* through **34***f* provide an example of a sequence of menus that a subscriher may encounter witb an on-line data service. In particular, tbis example relates to airline information and reservations and the subscriher in this sequence is reserving and purchasing airline tickets. FIG. **34***b* is an example of the first submenu **1332** for a data service offering various options. In this case, tbe subscriher has the option of checking current reservations or making new reservations. In each of these submenus related to a data service, the subscriher is ahle to return to the home menu **1010** or regular cahle TV and exit the data service. FIG. **34***c* requires tbe subscriher to enter information related to his airline reservation in this submenu **1334**, sucb as: domestic or international flight, year of flight reservation, month of flight reservation.

FIG. **34***d* is anotber submenu in the airline information and reservation data service. FIG. **34***d* provides an example of bow the subscriher may cboose among many options on a single screen **1336**. In this manner, tbe preferred embodiment of the system can avoid the use of a separate keyboard for textual entry. Although a separate keyboard may he provided as an upgrade, it is an added expense which some subscribers may wish to avoid. FIG. **34***d* shows an "eye off the remote" approach to entering information. FIG. **34***d* allows the user to chose the State in which he will depart and tbe state in which he will arrive. The airline information reservation submenu **1338** shown in FIG. **34***e* allows a subscriher to choose the airports from whicb he will depart and arrive and also the approximate time period of his departure and his arrival. FIG. **34***f*, an airline information and reservation submenu **1340**, allows a subscriher to view six availahle flights. A subscriher may select one of the flights to check on its availahility.

FIG. **34***g*, an airline information and reservation submenu **1342**, allows a subscriber to enter the month, day and year for the availability date he desires. In this submenu, tbe subscriher is offered the option of correcting any errors in the entered information. This particular submenu is for a particular flight, including flight number.

FIG. **34***h*, an airline information and reservation submenu **1344**, allows a subscriber to view remaining seats available on a flight. From the menu, tbe subscriber may select his seat assignments. This submenu is an example of bow information may he grapbically shown to a subscriher using a portion of the menu and different coloring schemes. In tbis menu, the lower half of the screen shows the passenger compartment of an airplane with all the seat locations graphically represented by square hlocks. By coloring the

available seat locations in blue and tbe unavailable seat locations in a different color, the menu can present a great deal of information in a limited amount of space. This graphic presentation of information for tbe interactive on-line data services is an important method of visually displaying large amounts of information to the subscriber.

FIG. **34***i*, an airline information and reservation submenu **1346**, allows the subscriber to cboose a one-way or round-trip ticket and to confirm bis reservations. If the subscriber desires to proceed, be may cbarge his airline ticket to his credit card by cboosing the appropriate strip menu on the lower part of tbe screen.

FIG. **34***j*, an airline information and reservation submenu **1348**, is an example of how credit card purchases may be made using the interactive on-line data services. In this particular menu, the subscriber is cbarging a round-trip plane ticket on his credit card. The subscriber simply needs to enter his credit card number, expiration date, and credit card type to charge bis airline ticket.

FIG. **34***k*, an airline information and reservation submenu **1350**, is an example of a menu wbicb may be sbown wbenever an on-line data service is processing a request sent by the subscriber. In this particular menu, the on-line data service is processing tbe subscriber's credit card cbarge for his airline ticket.

FIG. **34***l*, an airline information and reservation submenu **1352**, confirms a subscriber's airline ticket purchase and passes on information on where the ticket may be picked up.

E. 13. Digital/Audio Program Cboices

FIG. **35***a* is a major menu **1038** displaying tbe digital/audio program choices which are available for subscribers wbo bave paid tbe monthly fee. In a cbart format, tbe major menu sbows tbe top five, top ten, and top forty songs available in six different categories of music. Below the cbart, the system is able to provide a text message describing tbe particulars of the audio program selected.

The digital/audio feature of the invention allows a subscriber to listen to CD quality audio selections tbrough his stereo. This can be accomplished by running cables directly from the set top terminal **220** to the subscriber's amplifier/stereo system. Alternatively, the user may listen to audio selections tbrougb bis television system.

FIGS. **35***d* and **35***e* are the same major menu **1038** as FIG. **35***a* but sbows a different selection and a different program description in the lower text **1408**, **1412**. From any of tbe menu screens for tbe digital/audio feature, the subscriber may return to regular cable TV witb the press of a single button.

FIGS. **35***b* and **35***c* are promotional menus **1400**, **1404** for tbe digital/audio feature. Using tbe same logos and menu format, the system can provide a text description enticing the subscriber to pay tbe monthly fee and join the service. In FIG. **35***b*, the menu allows the user to test the system with a free demonstration. The menu in FIG. **35***c* allows the subscriber to request additional promotional information about tbe system. Botb FIGS. **35***b* and **35***c* are representative of promotional menus tbat may be used througbout tbe menued system.

E. 14. Montbly Account Review

FIGS. **36***a*, **36***b* and **37***a*, **37***b* relate to tbe monthly account review capabilities available to the subscriber. In tbe preferred embodiment, tbe subscriber may choose to access tbe monthly account review capability from both tbe introductory menu **1000** and home menu **1010**. The monthly account review screen sbows alternative window types that are available to tbe set top terminal **220**. For example, in the upper left-hand corner of the monthly account review, the current time and date are both sbown. The upper right-band corner provides tbe subscriber with instructions on bow to use tbe montbly account review capability. FIG. **36***b* also sbows that windows may be created in a variety of shapes. For instance, on the lower rigbt-band part of tbe screen **1612** two triangularly sbaped windows with messages are shown. In addition, on the left lower part of tbe screen **1612** a window in tbe shape of a trapezoid is sbown witb a textual message inside.

The montbly account review provides a list of cbarges from tbe first day of tbe montb to tbe date of viewing for eacb major menu. Charges are incurred on a pay-per-view basis and on a subscription basis (weekly, monthly, quarterly, etc.). At the lower part of the screen, the total of the cbarges incurred for the month is listed. The account status can also be calculated on a weekly, quarterly or semi-annual basis.

If tbe user moves his cursor to highligbt one of tbe eigbt menus listed and depresses the "go" button, be will obtain further billing information on tbe menu. FIGS. **36***a* and **36***b* sbow in screens **1610** and **1612**, respectively, tbe subscriber selecting menu A for further information.

FIGS. **37***a* and **37***b* are submenus for tbe monthly account review and displays detailed billing information about selections made on menu A. The date of eacb movie selection, title of tbe movie, and price for eacb movie is displayed (**1614**, **1616**). Also, any discounts which have been granted are displayed. The total charges on this menu and the day in wbicb tbe menu will be cbanged are sbown in the lower part of the screen. From this submenu, the subscriber may either return to regular TV or return to tbe major menu for tbe montbly account review. If tbe submenu information does not fit on a single screen, an extended submenu may be utilized witb follow on extension screens. Alternatively, a scrolling feature may be used enabling tbe subscriber to scroll additional information onto tbe first submenu screen.

The account information necessary to create the monthly account review menus may be stored either in tbe memory of tbe set top terminal **220** or at a remote location that communicates with the set top terminal **220**. In the simplest embodiment, tbe set top terminal **220** records a subscriber's selections locally and calculates the monthly account review based upon the subscriber's selections wbicb require the payment of fees. This monthly account information is stored locally and sent to the cable beadend **208** at least once a montb for back-up and billing purposes.

Alternatively, the subscriber's viewing selections and billing information may be continuously maintained at tbe cable beadend **208** or a remote site connected via communication lines to tbe cable beadend **208**. The cable beadend **208** or the remote site must regularly transmit the monthly account information to the set top terminal **220**. Eacb embodiment has advantages and disadvantages. If the account information and processing is done locally at the set top terminal **220**, each set top terminal **220** must be provided witb tbe memory and necessary processing capability to maintain tbe account. This greatly increases tbe cost of a set top terminal **220**. If the account information is maintained remotely, the remote site must remain in regular contact witb tbe set top terminal **220** in order to provide tbe subscriber with billing information.

To accommodate bomes with multiple viewers two or more set top terminals **220** may be placed on a single bill or two accounts may be created for one set top terminal **220**.

After menu configuration **324**, tbe CAP **260** may begin tbe process of generating a program control information signal **326** (see also FIG. **8** software description at **442** and

404). In order to generate program control information signals 326 which are specific to a particular cable headend 208 system, the CAP 260 incorporates cable franchise configuration information 328. In the preferred embodiment, unique cable franchise configuration information 328 is stored at the Operations Center 202. The cable franchises upload changes to their specific franchise information 426 from time to time to the Operations Center 202 for storage 328. Preferably, a separate CPU (not shown) handles the management of the cable franchise information 328. From the stored cable franchise information 328, the CAP 260 generates a cable franchise control information signal 330 unique to each franchise.

Using the unique cable franchise control information signals 328 and the menu configuration 324 information, the CAP 260 generates the program control information signal 276, as shown at function block 326. The program control information that is unique to a particular cable franchise may he identified in various ways such as with a header. With the header identification, the cable headend 208 may extract the portions of the program control information signal 276 it needs. Now, the CAP 260 may complete its process hy electronically packaging the programs into groupings 280 for the signal transmission and adding the program control information 276 to the packaged programs 334 to form a single signal for transmission. Through manual entries hy the packager (PDEI 400) or hy comparing against a list of programs, the CAP 260 will determine whether the programs are arriving from external sources 280 or sources internal 286 to the Operations Center 202.

Referring back to FIG. 11, upon completion of the CAP's functions, the Operations Center 202, or the uplink site 204 (FIG. 1), compresses 288 (if necessary), multiplexes 290, modulates 292 and amplifies 294 the signal for satellite transmission 296. In a basic embodiment, the CAP 260 will also allow entry of time slots for local avails where no national programming will occur.

FIG. 13 is a more detailed flow chart 340 of some of the functions performed hy the CAP 260 after an initial program schedule has been entered and menu configurations generated. This flow chart highlights that some of the functions described earlier in reference to FIGS. 8, 9, 11 and 12 can he performed in parallel. The flow chart 340 shows six hasic functions that are performed hy the CAP 260: (1) editing program schedule for local availability 342 (only for non-standard services, i.e., those services that are not national cable services); (2) generating program control information signals 344; (3) processing external programs 346; (4) processing internal programs 348; (5) processing live feeds 350; and, (6) packaging of program information 352. In an alternate embodiment, the CAP 260 is capable of incorporating local programs and accommodating local availability for local television stations.

Following completion of the programming scheduling (accounting for local availability if necessary) and menu generation 342, the CAP 260 may perform three tasks simultaneously, generating program information signals 344, processing external programs 346 and processing internal programs 348.

The CAP 260 automatically identifies external programs feeds 356 and identifies which external feed to request the external program 358. The CAP 260 gathers and receives the external programming information 280, 282 (FIG. 11) and converts it to a standard digital format 360 for use. The CAP 260 also identifies internal programs 362 (and defined program services), accesses the internal programs 364 (and program services), and converts them to a standard digital format 366, if necessary. In addition, the CAP 260 identifies live signal feeds 368 that will he necessary to complete the packaged programming signal 370. In its last task depicted in FIG. 13 the CAP 260 completes the packaging of the programs and combines the packaged program signal with the program control information signal 352, amplifies the signal 354 and sends it out for further processing prior to uplink.

F. Allocation of Cahle System Bandwidth

One of the primary tasks of the Operations Center 202 is, with assistance from the cable headends 208, effective utilization of available handwidth from the Operations Center 202 to the subscriher homes. FIG. 14 shows effective allocation of 750 mHz of handwidth (1 mHz to 750 mHz) for television programming. In FIG. 14, handwidth is allocated for hoth analog 226 and digitally compressed 227 signals. In the preferred embodiment, the bandwidth is divided so that each category of programs receives a portion of the bandwidth. These categories correspond with major menus of the set top terminal software. The representative categories shown in FIG. 14 include: (1) high definition TV (HDTV) made possible through the use of compression technology, (2) A La Carte Channel category which provides specialty channels for subscription periods such as monthly, and (3) pay-per-view.

FIG. 15 shows a chart 228 of compressed channel allocation for a variety of programming categories 229 that have heen found to he desirahle to subscribers. By grouping similar shows or a series of shows into hlocks of channels 230, the system 200 is able to more conveniently display similar programming with on-screen television menus. For example, in the movie category, which has the greatest allocation of channels, the same movie may he shown continuously and simultaneously on different channels. Each channel starts the movie at a different time allowing the subscriher to choose a more suitahle movie starting time (e.g., every 15 minutes).

In order to accommodate cahle TV systems that have different bandwidths and channel capacities, the television programming and television program control information may be divided into parts such as priority one, two and three. The large handwidth cahle TV systems can accommodate all the parts of the television programming and all parts of the television programming control information. Those cahle TV systems with a more limited handwidth are ahle to use the program delivery system 200 by only accepting the number of parts that the cahle system can handle within its handwidth.

For instance, as is shown in FIG. 16, three cahle television systems with different handwidths may use the program delivery system 200 simultaneously with each system accepting only those parts of the information sent which it is capahle of handling. Priority one television programming and menus 240 are accepted hy all three systems. Priority two television programming and menus 242 are not accepted hy the cahle television system whose capacity is the smallest or in this case 330 mHz (40 channels) system. Priority two television programming and menus 242 are accepted and used by the two larger capacity cahle television systems shown. Priority three television programming and menus 244 are only used hy the largest capacity television system which is capahle of handling all three parts—Priority one, two and three programming and menu information.

With this division of television programming and menus, the program delivery system 200 may he utilized simultaneously hy a variety of concatenated cable systems 210 (depicted in FIG. 1) with varying system capacities. By

placing the heavily watched or more profitable programming and menus in the priority one division **240**, both users and owners of the cable TV systems will he accommodated as best as possible within the limited bandwidth.

FIG. **17** shows three different cable headend **208** systems, each system receiving the entire satellite signal from the Operations Center **202** and stripping those parts of the signal which cannot be handled by the local cable system due to bandwidth limitations. In this particular embodiment, the three local cable television systems shown have bandwidth limitations which correspond with the bandwidth limitations depicted in the previous FIG. **16**. As the bandwidth decreases, the programming options available to the viewer in the exemplary on-screen menu decreases. Using this preferred embodiment, the Operations Center **202** is able to send one identical signal to the satellite **206** that is sent to all the cable headends **208**. Each cable headend **208** accepts the entire signal and customizes the signal for the local cable system by stripping those portions of the Operations Center signal that are unable to he handled by the local cable system. An alternate embodiment (not shown) requires the Operations Center **202** (and uplink sites **204**) to send different signals for reception hy different capacity cable headends **208**.

There are several ways in which a cable headend **208** may strip the unnecessary signal from the Operations Center **202**. A person skilled in the art will derive many methods from the three examples discussed below. The first method is for the signal originating from the Operations Center **202** (and uplink site **204**) to he sent in portions with each portion having a separate header. The respective cable headend **208** would then recognize the headers and transmit to the concatenated cable system **210** only those signals in which the proper headers are identified. For example, using three concatenated cable systems shown in FIG. **17**, the headers may he "001," "002," and "003." A wide bandwidth concatenated cable system can accept program signals with all three headers, while the narrowest bandwidth concatenated cable system may only he able to accept signals with a "001" header. For this first method, a central Operations Center **202** must divide the program signal into three parts and send a separate leading header before each signal for each part. This method requires has the additional signal overhead of a header on the program signal. The header would he transmitted from time to time as necessary.

A second method requires a set of transponders to he assigned to each priority level and the cable headend **208** to route signals from the transponders corresponding to the proper priority level for the concatenated cable system **210**. For example, if there are three priority levels and eighteen transponders, transponders one through nine may he assigned to priority level one, transponders ten through fourteen priority level two, and transponders fifteen through eighteen assigned to priority level three. Thus, a concatenated cable system **210** capable of operating only at priority level two, would only receive signals from transponders one through nine, and ten through fourteen from the respective cable headend **208**. The program signal from transponders fifteen through eighteen would not be transmitted to the priority level two concatenated cable system. This method requires the Operations Center **202** to properly assign programs to transponders by priority level. This can he accomplished by the CAP using the software described earlier (e.g., FIG. **8** at **438** and **440**).

The third and the preferred method is for the cable headend **208** to pick and choose programming from each transponder and create a customized priority one, two, and three signal with chosen television programming. The cable headend **208** would then route the appropriate customized signal to each part of the concatenated cable system **210** that the cable headend **208** serves. This third method requires that the cable headend **208** have a component, such as the combiner (described in greater detail in a co-pending U.S. Patent Application entitled Digital Cable Headend For A Cable Television Delivery System, Ser. No. 08/160,283, filed Dec. 2, 1993, owned by the assignee of the present application) which can select among programs prior to combining the signal for further transmission on a concatenated cable system **210**. The third method requires the least coordination between Operations Center **202** and the cable headend **208**.

In addition to dividing the television programming and menus into parts, the Operations Center **202** of the preferred embodiment is also capable of dynamically changing the bandwidth allocation for a particular category of programming. FIG. **18** depicts this dynamic change in bandwidth allocation from a typical week day prime time signal **250** to a Saturday afternoon in October signal **252** (during the college football season). FIG. **18** highlights the fact that the bandwidth allocated to sports is limited to eight selections **251** during week day prime time **250** but is increased to sixteen selections **253** during a Saturday afternoon in October **252**. This dynamic increase in bandwidth allocation allows the system to accommodate changes in programming occurring on an hourly, daily, weekly, monthly, seasonal and annual basis.

In addition to dynamically allocating bandwidth for programming categories, the Operations Center **202** can also dynamically change the menu capacities in order to accommodate the change in programming and bandwidth. For example, on a Saturday afternoon in October **252**, the major menu for sports may include a separate subcategory for college football. This subcategory would, in turn, have a separate submenu with a listing of four, six, eight, or more college football games available for viewing. In order to accommodate this dynamic menu change, the Operations Center **202** must add a submenu listing to the major sports menu, create a new or temporary submenu for college football, and allocate the necessary menu space on the college football submenu.

Once the television programs have been packaged and a program control information signal is generated to describe the various categories and programs available, the packaged programs are then digitized, compressed, and combined with the program control information signal. Upon the signal's departure from the Operations Center **202** the breakdown into categories is insignificant and the signal is treated like any other digitally compressed signal

G. Compressing and Transmitting Program Signals

After packaging, the packaged television program signal is prepared for satellite transmission and sent from the Operations Center **202** to the cable headend **208** via satellite **206**. Depending on the specific embodiment, the television program signal may need to he compressed, combined/multiplexed, encoded, mapped, modulated, upconverted and amplified. This system, which is intended to he compatible with existing C and Ku Band satellite transmission technologies, accepts video, audio and data signals ranging in signal quality, and input from a number of sources.

As shown in FIG. **3**, in the preferred embodiment, the packaged program signal will he treated at a master control uplink site **211** prior to heing transmitted to the satellite **206**. Following compression the channels must be multiplexed for each transponder carrier and sent to the satellite **206** dish

that will provide the uplink. A variety of multiplexing schemes may he used in the system. In some situations, it may be advantageous to use different multiplexing schemes in different parts of the overall system. In other words, one multiplexing scheme may be used for satellite transmission **206** and a second remultiplexing scheme for the land transmission. Various satellite multi-accessing schemes and architectures can be used with the system, including both single channel per carrier (SCPC) frequency division multiplex (FDM) and multiple channel per carrier (MCPC) time division multiplexing (TDM). Time division multiplexing is the more desirahle scheme. Once the signal has arrived at the uplink or master control site **211**, it must he modulated, upconverted, and amplified. Various types of satellites and transponders capable of handling digital signals may be used in this cahle television packaging and delivery system. One of the achievements of the present invention is effective utilization of digital compression technology hy packaging television programs into categories that allow easy access to television programs hy consumers. With current digital compression techniques for video, the typical 50-channel capacity cahle satellite receiving system can he increased to 300 channels.

Presently, one transponder is used for each satellite delivered channel. The preferred embodiment uses **18** satellite transponders and compression ratios of 4:1 to 8:1 to achieve a capacity of 136 satellite delivered channels. More transponders or higher compression ratios can he used to deliver up to the channel capacity of any existing cable system.

An example of a satellite that may he used is the AT&T Telstar **303**. The signal is transmitted from the satellite **206** to the cahle headend **208** where a computer system including a digital switch treats the signal and delivers it through cables to a subscriber's home. In alternate embodiments, multiple Operations Center **202** and multiple uplink sites **211** can he simultaneously utilized.

H. Cahle System Use of Control Signal

FIGS. **19** through **21** depict sample menu screens produced hy the set top terminal **220** using the program control information signal **276**. FIG. **19** shows a menu which enahles the viewer to select a program category or program service from among a choice of eight program categories. FIG. **20** shows a menu the viewer to select a hit movie from among ten hit movies. FIG. **21** provides information about a movie (or event) and enahles a viewer to order the movie for viewing.

FIGS. **19** through **21** show text generation hy the set top terminal **220**. This text is generated using information received via the program control information signal. FIG. **20** shows the text **380** generated for the hit movies major menu. In the preferred embodiment, text **380** such as that shown in FIGS. **19** through **21** is generated separately hy a text generator (not shown) in the set top terminal unit **220**. Those portions of the text that generally remain unchanged for a period of weeks or months may be stored in EEPROM or other local storage. For example, the text "HIT MOVIES from" **382** will consistently appear on each hit movies' major menu. This text may he stored on EEPROM or other local storage. Further, text such as that which appears at the lower center part of the screen "PRESS HERE TO RETURN TO CABLE TV" **384** appears many times throughout the menu sequence. This text may also be stored locally at the set top terminal **220**. Text which changes on a regular hasis, such as the movie titles (or other program selections), will he transmitted to the set top terminal **220** hy either the operations center **202** or the cahle headend **208**. In this manner, the cahle headend **208** may change the program selections availahle on any major menu modifying the program control information signal sent hy the operations center **202** and transmitting the change. The network controller **214** of the cahle headend **208** generally modifies the program control information signal and transmits the set top terminal control information signal (STTCIS). It is preferred that the text **380** is generated hy the set top terminal **220** separately from the graphics hecause the text can he stored locally in a more compact manner requiring less storage space at the set top terminal **220**. In addition, it allows for easy communication of text changes from the operations center **202** or cahle headend **208** to the set top terminal **220**.

FIGS. **19** through **21** show the use of day, date and time **386** information on menus. This information may he obtained in a variety of ways. The day, date, and time information **386** may he sent from the operations center **202**, the cahle headend **208** (signal processor or network controller **214**), the uplink site, or generated hy the set top terminal unit **220** internally. Each manner of generating the day, date, and time information **386** has advantages and disadvantages which may change given the particular embodiment and costs. In the preferred embodiment, the day, date, and time **386** are generated at a central location such as the operations center **202** and are adjusted for regional changes in time at the cahle headend **208**.

In order for the set top terminal **220** to generate submenus for subcategories of categories shown in FIG. **19** (which relate to the content of the programs), and to generate menus for movies such as FIG. **21**, the terminal must receive information on the content of the programs from the Operations Center **202** (via the cahle headend **208**). Normally the set top terminal **220** would receive this information in the form of the program control information signal (or STTCIS). As shown FIG. **21**, in addition to the text needed for these program menus, video or program scenes are also necessary.

Live video signals may he used in windows of certain menus such as FIG. **21**. These video signals can be sent via the program control information signal, STTCIS, or can he taken off channels being transmitted simultaneously with the menu display. If the video signal is taken off a channel, less information needs to he sent via the program control information signal. However, this technique requires that separate decompression hardware he used for the program control information and the channel carrying the video. Separate decompressors for the video signals and program information signal allows for the greatest flexihility in the system and is therefore the preferred embodiment. A separate decompressor also assists in assuring that the switch from menus to television programming is smooth and without any significant time delay.

Live video for menus, promos or demos may he sent to the set top terminal **220** in several ways: a) on a dedicated channel, h) on a regular program channel and scaled to size, c) sent along with the program control information signal, etc. However, in the preferred embodiment, a great deal of short promos or demo video are sent using a split screen technique on a dedicated channel.

Using a split screen technique, any number of different video clips may he sent (e.g., 2, 4, 6, or 8 video clips). To show the video clip on a menu, the video must either he scaled and redirected to a video window on a menu screen or a masking methodology can be used. Masking involves playing the entire channel of video (all 2, 4, 6, or 8 split screens) in background and masking the unwanted video clip portions of the split screen hy playing the menu in foreground and overlaying the unwanted background video.

Masking is the least expensive method because it does not require any special hardware and it increases video throughput to the set top terminal **220**. However, using the masking technique without any video redirecting causes each video clip to be located in a different position on the screen. It also requires the masking to be different for each video clip and makes consistent format difficult. On the other hand, scaling and redirecting video is generally difficult, expensive and requires additional hardware.

In order for the Operations Center **202** to prepare the promo video signal to be sent to the set top terminal **220**, the Operations Center **202** must first identify the duration and actual video cut to be used for each promo and its position within the promo video signal. This information is maintained within the Operations Center **202** database. When it is time to produce the promo video signal (either to tape or to broadcast), each promo cut is scaled, positioned and combined with the other promos to form the single promo video signal. This is performed by readily available commercial equipment. Each promo is run repeatedly while the promo video signal is being generated. The audio signals of the individual promo cuts may be combined into the promo video signal audio tracks based upon the number of audio tracks available. The mapping of the audio tracks to the promos is also stored in the Operations Center database. Additionally, the mapping of promos to the programs that they are previewing is also stored in the Operations Center database. All promo database data is made available to the set top terminal **220** through the STTCIS.

In the preferred embodiment, the Operations Center **202** transmits six video/graphic promos for advertising purposes all on one channel. The throughput of the video/graphics on a single channel can be increased through the use of digital compression techniques. The set top terminal **220** uses either video scaling and redirecting techniques or masking to utilize the six video scenes. Although the set top terminal **220** actually performs the manipulation of video as necessary to generate the "live" menus for the subscriber, the appropriately prepared video signals must be formed and sent by the Operations Center **202** to the set top terminal **220**.

If a promo for a given program is available at the set top terminal **220**, the viewer may command the set top terminal **220** to display the promo. Generally, this is done through program selection from a menu screen by the subscriber. The selected program is referenced to information about available promos and allows the set top terminal **220** to tune to the proper channel, select the appropriate menu overlay mask based on the promos position and switch on the audio track(s) if they are available. The promos position on the screen dictates the displaying of the "live" text (refer to the video window of FIG. **21**). The program associated with the currently selected promo may be purchased from this menu screen. Events, services and slices of time may be purchased from promotional menus.

Management of promo video signals at the Operations Center **202** is similar to that of other programs except that more information is needed in order to specify the details of the promo video signal. The broadcasting of the promo video signal is identical to the broadcasting of a video program.

In order to limit the amount of bandwidth needed to transmit the program control information signal, various compression techniques employed for non-video may be used such as block coding, contour coding, blob encoding, and run-length encoding. Further, the program control information signal may be divided into text and graphics, or video, text and graphics and then recombined at the set top terminal **220** using a text generator, graphics decompression, and video decompression as necessary.

As shown in FIG. **2**, an analog cable TV system **205** can continue to exist alongside and within the digitally compressed system of the present invention. The digital transmissions do not effect the analog system. In fact, the analog cable signal may be transmitted simultaneously on the same cable as the digital signal. Cable headends **208** may continue to supply subscribers with local channels in an analog signal format.

In the preferred embodiment, the Operations Center **202** and uplink **204** (FIG. **1**) or master control site **211** (FIG. **3**) are collocated. However, the Operations Center **202** and uplink site **204** may be located in different geographical places. Also, functions and equipment within the Operations Center **202** may be remotely located. For instance, the program storage may be at a different site and the programs may be sent to the CAP **260** via landline.

Alternate embodiments of the system **200** of the present invention may use multiple Operations Centers described above. In such an embodiment, it is preferred that one Operations Center be designated the Master Operations Center and all other Operations Centers be Slave Operations Centers. The Master Operations Center performs the functions of managing and coordinating the Slave Operations Centers. Depending on the method in which the Slave Operations Centers share functions, the Master Operations Center coordination function may involve synchronization of simultaneous transmissions from multiple Slave Operations Centers. To perform its functions, the Master Operations Center may include a system clock for synchronization.

An efficient method of dividing tasks among multiple Operations Centers is to assign specific satellite transponders to each Operations Center **202** and to assign external program sources to the nearest Operations Center **202**. Of course, this division of resources may not always be possible. Since programming will be grouped into priority levels with each priority level likely to be assigned specific satellite transponders, it is also possible to assign each Operations Center **202** to a priority level. For example, in a three priority level system with two Slave Operations Centers A and B and 18 transponders, the Master Operations Center may be assigned priority level 1 and assigned 9 transponders. Slave Operations Center A may be assigned priority level 2 and 5 transponders, while Slave Operations Center B is assigned priority level 3 and 4 transponders. In a multiple Operations Center configuration dynamic bandwidth allocation and dynamic menu capacity allocation becomes more complex and will be coordinated by the Master Operations Center.

Just as in the alternate embodiment wherein multiple Operations Centers **202** are used, a delivery system may have multiple satellite uplinks. Preferably, each Operations Center **202** has one or more uplink sites. Each Operations Center **202** controls the functions of its assigned uplink sites and may assign one site as a master uplink site.

In another alternative configuration, in regions or areas without cable services, where subscribers might use backyard satellite systems (TV RO) to receive packaged television services, the set top terminal **220** will include the appropriate hardware to allow connection to the backyard satellite reception equipment, i.e., a typical communication port. In this configuration, the backyard satellite system will receive programming signals originating from the Operations Center **202** directly from the satellite transponders. No

cable headend **208** is utilized with a backyard satellite system. The menu system within the set top terminal **220** will he programmed directly from the Operations Center **202**. The Operations Center program signals and control signals arrive at the set top terminal **220** essentially unchanged. Additionally, in this configuration, an upstream communication mechanism must he in place at the subscriber's home (e.g., modem) to communicate information to the Operations Center **202** such as program ordering information. The set top terminals **220** can he equipped with a modem port for this upstream communication to the Operations Center **202**. The two alternative embodiments described in the preceding four paragraphs, and other such embodiments not specifically referred to herein hut within the understanding of those skilled in the art, incorporate or combine one or more of the components of the system **200** of the present invention.

Although the present invention has been shown and described with respect to preferred embodiments, various changes and modification that are obvious to a person skilled in the art to which the invention pertains are deemed to lie within the spirit and scope of the invention as defined hy the following claims.

What is claimed is:

1. An operations center for generating menus and a digital data signal to he used in television program delivery, comprising:

a receiver, wherein information, including information on television programs, is received;

a memory for storing the received information;

a first processor for generating menus using the information stored in memory, wherein the menus are generated automatically hy the operations center by analyzing the information using a heuristic;

a display, operahly connected to the first processor, for displaying the generated menus;

an input device, operably connected to the first processor, for entering changes to the displayed menus;

a second processor, operahly connected to the first processor, for generating a digital data signal containing data from the changed or displayed menus; and

a transmitter, operahly connected to the second processor, for transmitting the generated digital data signal, whereby menus may he generated using the contained data on the transmitted digital data signal.

2. The operations center of claim **1** wherein the first processor comprises a means for generating program selection menus.

3. The operations center of claim **2** wherein the program selection menus include an introductory menu, a home menu, at least one major menu, and at least one suhmenu.

4. The operations center of claim **3** wherein the introductory menu welcomes a user and offers the user at least one option.

5. The operations center of claim **4** wherein the introductory menu offers the user regular cahle television, programs on demand, and instructions on the use of a remote control.

6. The operations center of claim **1** wherein the first processor comprises a means for generating menu windows which may be customized hy a user.

7. The operations center of claim **1** wherein the first processor comprises a means for generating a home menu with multiple windows which make the home menu user-friendly.

8. The operations center of claim **7** wherein the home menu includes major menu categories and the home menu displays a channel line-up and the major menu categories.

9. The operations center of claim **8** wherein the channel line-up comprises standard channels and programming on demand icons.

10. The operations center of claim **8** wherein the channel line-up comprises Basic cable and Basic Plus packages.

11. The operations center of claim **8** wherein the channel line-up comprises one or more of the most popularly watched channels.

12. The operations center of claim **8** wherein the home menu comprises at least one additional accessihle screen.

13. The operations center of claim **1**, wherein the first processor comprises a means for generating a mood question menu.

14. The operations center of claim **13** wherein the mood question menu includes one or more of mood question screens, each of which prompt a viewer for information concerning the viewer's mood.

15. The operations center of claim **3** wherein at least one of the major menus is for a category of programming.

16. The operations center of claim **15** wherein the different categories of programming include at least one of the following: sporting events, children's programming, entertainment choices, documentaries, news, magazines, broadcast TV, cable TV, high-definition television (HDTV), interactive television choices, program availahle services, digital audio, programs on demand, and hit movies.

17. The operations center of claim **16** wherein the hit movies major menu includes options of availahle popular movies which may he selected.

18. The operations center of claim **16** wherein the HDTV major menu includes a description of HDTV and a suggestion to order.

19. The operations center of claim **16** wherein the HDTV major menu includes options of the currently available HDTV programming.

20. The operations center of claim **16** wherein the program availahle services major menu includes options on programs availahle on network schedules and offers a plurality of program schedule suhmenus.

21. The operations center of claim **20** wherein the plurality of program schedule suhmenus include seven-day network schedule, current-day network schedule, and TV guide picks sub-menus.

22. The operations center of claim **16** wherein the digital audio major menu displays digital audio program options.

23. The operations center of claim **22** wherein the digital audio major menu shows top songs availahle in one or more different categories of songs.

24. The operations center of claim **1** wherein the first processor comprises a means for generating a confirmation menu.

25. The operations center of claim **3** wherein the major menus include suhmenu options relating to one or more subcategories of programming.

26. The operations center of claim **25** wherein the suhmenus includes listings corresponding to other suhmenus.

27. The operations center of claim **25** wherein the suhmenus include program identities.

28. The operations center of claim **27** wherein the program identities are from a particular category or subcategory of programming.

29. The operations center of claim **28** wherein one particular subcategory of program identities is defined hy the time of viewing.

30. The operations center of claim **3** wherein the suhmenus comprise a notification suhmenu notifying a user that a program selection is about to hegin.

31. The operations center of claim 30 wherein the notification submenu displays a countdown timer which indicates remaining time to the beginning of the program selection.

32. The operations center of claim 30 wherein the notification submenu allows the user to cancel the program selection.

33. The operations center of claim 30 wherein the notification submenu comprises:

a window showing the program selection and the amount of time before the program selection begins;

a video window that displays a scene from the program selection; and

a second window that presents the user with an option on escaping the program selection without charge.

34. The operations center of claim 3 wherein the submenus comprise a rejoin submenu that includes reentry menu selections for rejoining an exited program, the reentry menu selections including one or more identified start times.

35. The operations center of claim 3 wherein the submenus comprise a program order submenu and a program confirmation submenu.

36. The operations center of claim 3 wherein the submenus comprise a program description submenu from which a user may choose to record a selected program on a VCR.

37. The operations center of claim 3 wherein the submenus comprise an interactive Level A submenu offering a variety of interactivity with a television program being viewed.

38. The operations center of claim 37 wherein the variety of interactivity includes one or more of the following: quizzes, fast facts, more info, geographical facts, and products.

39. The operations center of claim 37 wherein the submenus comprise one or more of: a quiz submenu, a fast fact submenu, a more info submenu, a geographical facts submenu, and a products submenu.

40. The operations center of claim 3 wherein the submenus comprise an interactive Level B submenu offering on-line services.

41. The operations center of claim 40 wherein the on-line services include one or more of: Yellow Pages and airline reservations.

42. The operations center of claim 40 wherein the submenus comprise a plurality of airline information and reservation submenus.

43. The operations center of claim 3 wherein the submenus comprise an interactive Level C submenu offering multi-media experiences.

44. The operations center of claim 1 wherein the first processor comprises a means for generating at least one during program menu.

45. The operations center of claim 44 wherein the during program menus comprise one or more of: a one hidden menu and an overlay menu.

46. The operations center of claim 45 wherein a user has a specific time to escape from a program selection and the overlay menu informs a user when the specific time to escape from a program selection will expire.

47. The operations center of claim 45 wherein the overlay menu informs a user that the user is escaping from a program selection after being charged for the program selection.

48. The operations center of claim 45, wherein the hidden menu remains unseen by a user during program viewing, but is generated when the user presses one or more key strokes on a remote control.

49. The operations center of claim 48 wherein the key strokes include one or more of: escape, cancel selection, or icon selection.

50. The operations center of claim 49 wherein the hidden menu triggers the display of an overlay menu in response to the user's key stroke.

51. The operations center of claim 1 wherein the first processor comprises a means for generating at least one promotional menu for selling subscriptions to services.

52. The operations center of claim 51 wherein the promotional menu is for HDTV services and describes the HDTV services and its availability.

53. The operations center of claim 51 wherein the promotional menu is for interactive services and provides additional information about the interactive services.

54. The operations center of claim 51 wherein the promotional menu is an interactive logo overlay menu that allows a user to select interactive features or return to a television program being viewed.

55. The operations center of claim 51 wherein the promotional menu is for digital audio services and provides a text description enticing a user to pay a monthly fee and join the service.

56. The operations center of claim 1 wherein the first processor comprises a means for generating an account review menu which displays information concerning a user's account.

57. The operations center of claim 56 wherein the account review menu provides a list of charges from the first day of a month to the date of viewing.

58. The operations center of claim 3 wherein the submenus comprise account review submenus which provide detailed billing information about one or more specific charges.

59. The operations center of claim 1 wherein the received information includes one or more of: viewer data, ratings data, demographics data, program importance data, times-purchased data, cost data, menu placement data, category data and lifespan data, and wherein the first processor includes a means for analyzing the received information.

60. The operations center of claim 1 wherein the first processor automatically generates menus based on the received information.

61. A method of generating menus and a digital data signal for use at television program viewer locations, comprising:

storing menu format data;

receiving input data about television programs;

storing the received input data;

generating a draft menu through the use of the stored input data and the menu format data, wherein the draft menu is generated automatically by an operations center by analyzing the input data using a heuristic;

displaying the draft menu;

editing the displayed draft menu, wherein the edited menu includes a program line-up;

repeating the steps of generating, displaying, and editing to generate additional edited menus;

processing the edited menus to generate a digital data signal; and

transmitting the digital data signal for use at viewer locations, whereby at least one of the edited menus may be viewed by a viewer.

62. The method of claim 61 wherein the draft menu is one of the following: a draft introduction menu, a draft home menu, a draft major menu, a draft submenu, a draft hidden menu, or a draft overlay menu.

63. The method of claim 61 wherein input data used to generate a draft menu includes one or more of: viewer data, ratings data, demographics data, program importance data, times-purchased data, cost data, menu placement data, category data, and lifespan data, and wherein the step of generating a draft menu includes the step of analyzing the input data.

64. The method of claim 61 wherein the heuristic causes a program to move closer to or further from the top of the menu based on the input data about the program.

65. The method of claim 61 wherein the step of editing the draft menu includes the step of entering information by a packager.

66. The method of claim 61 wherein the step of generating a draft menu is automatically performed by an operations center and the step of editing the draft menu includes the step of entering information by a packager.

67. The method of claim 61 wherein the step of receiving comprises the step of entering input data by a packager.

68. The method of claim 61 further comprising the step of:

selecting programs from a pool of available programs.

69. The method of claim 68 further comprising the step of:

inputting requisite information about the selected programs; and

choosing the price for the selected programs.

70. The method of claim 68 further comprising the step of:

allocating transponder space for the selected programs.

71. The method of claim 61 wherein the edited menus are one of the following: an introductory menu, a home menu, at least one major menu, and at least one submenu.

72. The method of claim 61 wherein the draft menus are one of the following: a draft program selection menu, a draft during program menu, or a draft program confirmation menu.

* * * * *

COPY OF NOTICE OF APPEAL AND PRE-APPEAL BRIEF REQUEST FOR REVIEW FILED SEPTEMBER 20, 2007

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NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): UV/193

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on _____

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Typed or printed name _____

In re Application of: David M. Berezowski et al.

Application Number	Filed
09/823,705	March 30, 2001

For: SYSTEMS AND METHOD FOR IMPROVED AUDIENCE MEASURING

Art Unit	Examiner
2623	Annan Q. Shang

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20 (b)(1)) $500.00

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 06-1075. I have enclosed a duplicate copy of this sheet.

☒ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ attorney or agent of record. Registration number 54,026

☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

Signature

Michael J. Chasan
Typed or printed name

212-596-9000
Telephone number

September 20, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): UV-193

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

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Application Number	Filed
09/823,705	March 30, 2001
First Named Inventor	
David M. Berezowski	
Art Unit	**Examiner**
2623	Annan Q. Shang

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 54,026

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Signature

Michael J. Chasan
Typed or printed name

212-596-9000
Telephone number

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENTS
UV-193

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicants	:	David M. Berezowski et al.		
Application No.	:	09/823,705	Confirmation No. :	7437
Filed	:	March 30, 2001		
For	:	Systems and Methods for Improved Audience Measuring		
Art Unit	:	2623		
Examiner	:	Annan Q. Shang		

New York, NY 10036
September 20, 2007

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Pursuant to 1296 Off. Gaz. 2 (July 12, 2005), applicants request review of the rejection of claims 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 in the above-identified application. No amendments are being submitted with this Request. This Request is being filed with a Notice of Appeal.

ARGUMENTS

I. Introduction

Claims 1-6, 8-11, 13-46, 50-56, 58, 60-85, 87-90, 92-125, 129-135, 137, 139-164, 166-169, 171-204, 208-214, 216, and 218-237 are pending in this application. Claims 1-6, 9-11, 13-46, 50-56, 60-85, 88-90, 92-135, 139-164, 167-169, 171-204, 208-214, and 218-217 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Maissel et al. U.S. Patent 6,637,029 (hereinafter "Maissel"). Claims 8, 58, 87, 137, 166, and 216 have been rejected under

35 U.S.C. § 103(a) as being obvious over Maissel in view of Hendricks et al. U.S. Patent 6,539,548 (hereinafter "Hendricks"). Applicants respectfully traverse the rejections.

II. Applicants' Reply to the 35 U.S.C. § 102(e) Rejections

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Appellants respectfully submit that Maissel does not show each and every element of appellants' claims.

1. Independent Claims 1, 80, and 159

Applicants' independent claims 1, 80, and 159 are directed to a method and systems for measuring audience size information based on playbacks of a recorded program. Indications of playbacks of the recorded program are received from a plurality of audience members. In response to receiving these indications, audience size information is updated and this updated information is then provided to at least one user within an interactive television application.

The Examiner maintains that Maissel provides audience information for recorded programs. *See* Office Action, page 3. Applicants' respectfully disagree. Maissel defines the term "audience" as referring to "the sum total audience viewing all programs at a particular time, or to the total audience of viewers who are capable of receiving programs at a particular time." *See* Maissel, col. 19, lines 23-27. Thus, Maissel's definition of audience does not include an audience that is watching a program stored after broadcast – e.g. a recorded program. As a result, Maissel's real-time information, or updated audience information, is limited to programs currently being broadcast. *See* Maissel, col. 19, lines 27-30. This real-time information does not account for applicants' improvement of updating audience size information based on playbacks of a recorded program. Accordingly, Maissel does not provide audience information for recorded programs.

Further, applicants' independent claims 1, 80, and 159 require "updating audience size information for [a] recorded program" in response to receiving "indications of playbacks of the recorded program from a plurality of audience members." In contrast, Maissel merely refers to a television system which provides an "indication of a proportion of an audience currently

viewing a program," as well as a proportion of an audience currently viewing a program "not being viewed by a viewer." See *Maissel*, col. 5, line 51 through col. 6, line 19. In other words, Maissel's television system provides information about what proportion of an audience is watching currently broadcast programming. The Examiner's position in this rejection appears to be that Maissel's indication of a proportion of an audience currently viewing a program that is not currently being viewed by the viewer is the same thing as applicants' updating audience size information for a recorded program based on indications of playbacks of the recorded program. *See* Office Action, pages 3 and 5 referencing col. 19, lines 1-15 of Maissel. However, Maissel's programs that are "not being viewed by a viewer" are not the same as the recorded programs specified by applicants' claims, supported in applicants' specification, and widely understood by those skilled in the art.

In particular, applicants' specification as well as common sense clearly tell us that recorded programs are programs that have been stored after their broadcast. *See* specification, page 2, lines 13-21. Nowhere does Maissel show that its programs "not being viewed by a viewer" are programs that have been stored after their broadcast. Thus, the Examiner's contention that indications of playbacks of a recorded program is equivalent to indications of the programs, or content, not currently being viewed by the viewer is overbroad and unreasonable. Because Maissel does not show indications of playbacks of recorded programs, Maissel does not show updating audience size information for recorded programs. Instead, Maissel provides "real-time information" on what proportion of an audience is watching currently broadcast programming. For these reasons alone, applicants submit that independent claims 1, 80, and 159 are patentable over Maissel.

For at least the foregoing reasons, applicants submit that independent claims 1, 80, and 159 are patentable over Maissel. Applicants respectfully request, therefore, that the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn.

B. Independent Claims 29, 108, and 187

Applicants' independent claims 29, 108, and 187 are directed toward a method and systems for providing audience size information with program listings in an interactive television application. Indications that a user wishes to access one or more program listings are received from a user. Audience size information for a program corresponding to at least one of

the program listings is calculated. The calculating is based on a graded approach of assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members. For example, a predetermined quantity of points may be assigned to an audience member playing, pausing, rewinding and fast-forwarding a recorded program. See specification, page 39, lines 3-14. Program listings that include audience size information are provided in response to the indication from the user.

Each of applicants' independent claims recites calculating audience size information by "assigning a predetermined quantity of points to each of a plurality of actions performed by a plurality of audience members." In the Office Action, the Examiner contends that Maissel's "rule-based abstracted method to generate various on-screen alerts" shows this element of applicants' claims. *See* Office Action, page 3. Maissel maintains preference profiles, which are collections of information that describe users' viewing habits. An intelligent agent applies rules to this information to generate on-screen alerts to, *inter alia*, remind viewers that their favorite program is being broadcast. Applicants submit that the Examiner's contention that Maissel's intelligent agents assigns points to audience actions is particularly unreasonable. Nowhere does Maissel show that the intelligent agent's "rule-based abstracted method" assigns points to audience actions. Instead, Maissel's intelligent agent merely alerts users of programs based on the information in their preference profiles. Further, anyone skilled in the art would take applicants' claimed "assigning a predetermined quantity of points" to logically mean awarding a set number of points in response to a particular action. Nowhere does Maissel show this action as part of its intelligent agent or preference profile. Finally, and most importantly, nothing in Maissel shows using user viewing habits or other similar information to calculate audience size information. For these reasons, applicants submit that independent claims 29, 108, and 187 are patentable over Maissel.

C. Independent Claims 51, 130, and 209

Applicants' independent claims 51, 130, and 209 are directed toward a method and systems for measuring audience size information for an upcoming program in an interactive application. Indications to perform actions related to the upcoming program are received from a plurality of audience members. Audience size information is updated in response to receiving

the indications. Audience size information is then provided to at least one user within the interactive television application.

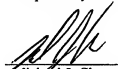
As described above with respect to independent claims 1, 80, and 159, Maissel only refers to providing audience size information based on programs available to the viewer in real time (i.e. "real-time information" on what proportion of an audience is watching currently broadcast programming). *See* Maissel, col. 19, lines 23-30. Maissel makes no reference to providing such information for an upcoming program. Therefore, Maissel does not show updating audience size information based on users viewing upcoming programs. For at least this reason, Maissel fails to show all of the features of applicants' independent claims 51, 130, and 209. Applicants respectfully request, therefore, that the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn..

III. Conclusion

Claims 2-6, 8-11, 13-28, 30-46, 50, 52-56, 58, 60-79, 81-85, 87-90, 92-107, 109-125, 129, 131-135, 137, 139-158, 160-164, 166-169, 171-186, 188-204, 208, 210-214, 216, and 218-237 depend on independent claims 1, 29, 51, 80, 108, 130, 159, 187, and 209, and are allowable at least because claims 1, 29, 51, 80, 108, 130, 159, 187, and 209 are allowable.

For the foregoing reasons, applicants submit this application is in condition for allowance. Reconsideration and allowance are respectfully requested.

Respectfully submitted,



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REVIEW DATED FEBRUARY 8, 2008

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,705	03/30/2001	David M. Berezowski	UV-193	7437

75563 7590 02/08/2008

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2623	
MAIL DATE	DELIVERY MODE
02/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

File No UV/193
Action Desc Appeal Brief Based on Pre-Appeal
Due Date March 5, 08
By CR

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	09/823,705	BEREZOWSKI ET AL.	
	Chris Kelley	Art Unit 2623	
Document Code - AP.PRE.DEC			

Notice of Panel Decision from Pre-Appeal Brief Review

This is in response to the Pre-Appeal Brief Request for Review filed 9/20/07.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☒ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☒ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: *all pending*.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☐ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *Chris Kelley*. (3) *John Peng*.

(2) *Annan Shang*. (4)_____.

(x.) Related Proceedings Appendix

None.